POSTER SESSION

POSTERS’ SESSION PS11: EPIDEMIOLOGY AND RISK FACTORS

**PP.11.02** ORTHOSTATIC HYPOTENSION AND MORTALITY THE HOMO STUDY

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Objective: To assess the impact of orthostatic hypotension (OH) on all-cause mortality.

Design and method: 1176 subjects over 18 years were included in this ambispective study. The subjects were from Cantabria, Spain. Blood pressure (BP) was measured in a sitting position, and after three minutes of standing, from May 2002 to February 2005. Mean follow-up was 9.4 ± 2 years. Data about age, gender, current smoker, alcohol, diabetes, body mass index (BMI), hypercholesterolemia, sedentary lifestyle, systolic and diastolic basal BP (SBP and DBP), antihypertensive treatment, basal heart rate, heart disease, arrhythmia, cerebrovascular disease, peripheral artery disease and headache were recorded. OH was defined as an decrease of SBP at least 20 mmHg, and/or DBP at least 10 mmHg, from sitting to standing position at three minutes after standing.

Results: The mean age was 48.5 ± 18.5 years (range: 18-98 years). 7.4 % (n = 87) individuals had OH. Those subjects with OH were older (p < 0.001), had significantly more diabetes (p = 0.028), hypertension (p < 0.001), antihypertensive treatment (p = 0.002), heart disease (p = 0.001) and cerebrovascular disease (p = 0.021). BMI (p = 0.005), SBP (p = 0.001) and DBP (p < 0.001) were also higher in this group. The mortality rate was 24.1%. A multivariate Cox proportional hazard model analysis demonstrated that current smoker (HR: 2.69; p = 0.003), peripheral artery disease (HR: 2.52; p = 0.014), arrhythmia (HR: 2.37; p = 0.002) and age (HR: 1.13; p < 0.001) were independent risk factors of all-cause mortality. OH was not a predictor of all-cause mortality in the adjusted model (HR: 1.23; CI 95 %: 0.72–2.10; (p = 0.448).

Conclusions: OH is not associated with all-cause mortality in a young population. Smoker, peripheral artery disease, arrhythmia and age were associated with all-cause mortality.

**PP.11.03** PREVALENCE AND CHARACTERISTICS OF THE PATIENTS WITH HYPERTENSION IN THE IBERICAN STUDY

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Objective: The general aim of IBERICAN study is to know the prevalence and incidence of cardiovascular risk factors (CVRF) and cardiovascular and renal disease (CVD) in Spain. The aim of this abstract is to know the prevalence of hypertension and its relation with CVRF, subclinical organ damage (LOD) and CVD in the population of the IBERICAN Study.

Design and method: The IBERICAN Study is a longitudinal, observational, and multicentric study with subjects between 18 to 85 years of age, recruited in Primary Care and who will be follow up at least 5 years. The final sample size is estimated in 7,000 patients. We show the baseline characteristics of the patients in the first visit (n = 3,042). We analyzed patients with hypertension and their association with the presence of CVRF (diabetes, dyslipidemia, smoking and obesity), LOD (left ventricular hypertrophy, glomerular filtration < 60 ml/min and albuminuria) and CVD: ischemic heart disease, heart failure, stroke, peripheral arterial disease and nephropathy.

Results: The mean age in the sample was 65.4 ± 11 years, 50.5% women. The prevalence of hypertension was 47.4% (n = 1,429), and their degree control was 58.5%. The prevalence of hypertension in men was higher than women: 52.9% vs 43%, P < 0.001. Every CVRF were more frequent in hypertensive patients: dyslipidemia 66.4% vs 35.9%, p < 0.001; diabetes 30.6% vs 8.5%, p < 0.001; obesity 44.4% vs 22.5%, p < 0.001; smoker 13.5% vs. 22.7%, p < 0.001; seden- tary lifestyle 34.3% vs. 25.5%, p < 0.001. Also, the LOD were more frequent with the hypertension: IVI 8.2% vs 1.4%, p < 0.001; GFR less than 60 ml/min 13.7% vs 8.2%, p < 0.05; albuminuria 13.4% vs. 5.6%, p < 0.001. Finally, the prevalence of cardiovascular disease was higher in hypertensive patients (21.6% vs 10.2%, p < 0.0001), ischemic heart disease (10.7% vs 5.3%, p < 0.001); stroke (6.5% vs 3%, p < 0.001); peripheral arterial disease (6.4% vs 2.5%, p < 0.0001) and heart failure (4.8% vs 1.3%, p < 0.001).

Conclusions: Patients with hypertension in Primary Care have higher prevalence of cardiovascular risk factors, subclinical organ injury and established cardiovascular disease. The degree of blood pressure control is clearly improved.

**PP.11.04** THE ROLE OF SERUM URIC ACID IN DEVELOPMENT OF HYPERTENSION IN THE BELARUSIAN URBAN POPULATION

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Objective: To analyze the role of serum uric acid levels in development of hypertension in a large adult population using the data from Belarusian national representative survey.

Design and method: A 5-year prospective analysis included 3500 individuals in a district of Vitebsk in 2007/2008 (coverage of the survey was 97.9%), 2010/2011 (coverage of the survey was 77.8%) and 2012/2013 (coverage of the survey was 84.3%). Hypertension was evaluated according to the WHO/ISH (1999). The survey included standard questionnaires for detection of cardiovascular risk factors, measurements of blood pressure, electrocardiography, serum uric acid and C-reactive protein, cholesterol data.

Results: We examined 2170 persons with normal blood pressure and 1257 persons with hypertension. Men and women were similar of mean age. In 5 years 285 new cases of hypertension developed (11.6% of men and 13.3% of women). There was revealed significant positive association between IV quartiles of serum uric acid level (339–527 mmol/l) and the frequency of new cases of hypertension adjusted for age and sex (df = 1; X2Wald = 5.1; p < 0.05). According to multifactorial regression analysis high uric acid level (>338 mmol/l) (p < 0.001) the same as systolic blood level (>120 mmHg) (p < 0.001), high body mass index level (>25.7 kg/m2) (p < 0.001), high level of the amount of ECG peaks (SV1+RV5–V6<25 mm) (p < 0.001), moderate increase in body mass index (23.7 kg/m2 < BMI <= 25.7 kg/m2) (p < 0.001), high level of heart rate (>70 beat/min) (p < 0.001), alcohol abuse (p < 0.01), family history of stroke (p < 0.05) are the most significant factors affecting the frequency of new cases of hypertension in the studied population. At the same time the level of serum uric acid was associated with male sex (p < 0.001). And there was no relation between serum uric acid and other risk factors.

Conclusions: The serum uric acid level is an independent risk factor for development of hypertension in the Belarusian urban population associated with male sex.

**PP.11.05** PATIENTS WITH ESTABLISHED CV DISEASE HAD HIGHER PREVALENCE OF SEVERAL RISK CV INDICATORS, WHEN COMPARED TO HIGH CV RISK POPULATION WITHOUT PREVIOUS EVENT


Objective: Pulse wave velocity (PWV) is considered a marker of cardiovascular (CV) risk prognosis. In a hypertensive population, higher values are associated
with an elevated CV risk and higher risk of events. However, the difference between patients with high CV without CV event, and those with established CV disease (defined by heart failure that implies hospital admission, coronary heart disease, stroke, peripheral artery disease) is not very defined. The authors aim to characterize a hypertensive population who was submitted to PWV and to identify features which could differentiate high CV risk population with or without previous event.

**Design and method:** 280 hypertensive medicated patients were studied. Continuous variables are expressed as mean and were compared using the unpaired Student’s t-test. Variables exhibiting skewed distributions are expressed as median and interquartile range and were compared using the Mann-Whitney test. Categorical variables are expressed as frequencies and percentages and were compared using the chi-squared test.

**Results:** Considering the 280 patients, the mean age was 52.94 ± 15.35 years. Mean BMI was 28.21 ± 4.73 Kg/m², mean SBP24 hours was 125.82 ± 11.59 mmHg, mean PWV was 8.93 ± 2.44. Fifty six patients had previous events. This group, when compared with those patients without previous event, were older (61.70 ± 9.27 years versus 50.75 ± 15.79), had a higher PWV (9.64 ± 2.13 versus 8.87 ± 2.49), higher prevalence of diabetes (32.1% versus 21.0%, p = 0.07) and dyslipidemia (73.2% versus 54.9%, p = 0.013). Also 41.1% of patients with previous event had PWV>10 m/s and only 23.7% of the patients without previous event had PWV>10 m/s (p = 0.009). Other risk indicators were also more prevalent in the established cardiovascular disease population, although without statistical significance: smoking (16.1% versus 12.1%, p = 0.423) and diastolic dysfunction (40% versus 33.3%; p = 0.472).

**Conclusions:** In our sample, patients with established CV disease had higher prevalence of several risk CV indicators, when compared to high CV risk population with previous event, pointing to a higher risk of recurrence of event when comparing with patients with high risk, but no previous event. The strict control of CV risk factors in this population is mandatory.

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**PP11.06 WHAT DO OUR PATIENTS ACTUALLY KNOW ABOUT HYPERTENSION?**

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**Objective:** To evaluate patient perception of Arterial Hypertension (HTN).

**Design and method:** Questionnaire posed to patients at our hospital clinics.

**Results:** Of the 100 patients who filled out questionnaires 64% were women, with an average age of 63. Only 23% had normal weight, 12% were smokers, and 41% practiced physical exercise regularly. Hypertension was present in 78% of patients, but only 12% could define it correctly. In 97% of cases, salt was a known contributor to HTN. Although 6% admitted adding extra salt at the table, 77% didn’t think they consumed too much. Regarding other prior medical history, the most frequent were dyslipidemia (53%) followed by diabetes (27%). 11% had a previous stroke and 9% a myocardial infarction (MI). Only 28% could name their current medication, and 29% couldn’t tell if using the an antihypertensive medication (AHM). The most frequent AHM were angiotensin converting enzyme inhibitors (26%), diuretics (26%), angiotensin receptor blockers (24%), beta-blockers (23%), and calcium antagonist (23%). Lack of compliance to therapy was admitted in 7% of cases. 96% were aware that poorly controlled BP could be fatal. The adverse outcomes most preferred were stroke (79%) and MI (64%). Only 64% believed their doctor explained HTN risks, and 13% didn’t know the possible consequences. 88% of patients knew their typical BP values, and 70% owned a tensiometer, but 25% had poor BP control. Awareness of measures to reduce stroke and MI risk was 92%. The most mentioned were diet (64%), salt reduction (60%) and physical exercise (47%). Drug compliance was only referred in 19% of cases and BP control in 18%. Most patients (71%) admitted they would like to have more information regarding HTN.

**Conclusions:** Despite HTN's high prevalence, knowledge about its definition, contributing factors and consequences is scarce. Diet, reduction of salt intake and exercise are considered more important in preventing cardiovascular disease than medication and control of cardiovascular risk factors. Most patients feel they need more information on HTN and our results support the importance of further health education.

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**PP11.09 CARDIOVASCULAR RISK ASSESSMENT, CLINICAL CHARACTERISTICS, AND COMORBIDITIES OF HOSPITALIZED PATIENTS WITH HYPERTENSION AND ACID-BASE DISORDERS**

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**Objective:** The aim of the study was to assess the cardiovascular risk of the hospitalized patients with hypertension and acid-base disorders.

**Design and method:** Design and methods. The retrospective study included 109 patients with hypertension and acid-base disorders admitted to clinical emergency hospital between August-November 2016.

**Results:** The average age was 73.64 years ± 11.39. The minimum age was 43 and maximum age were 97. From 109 patients 52.29% were female and 47.70% were male. The following distribution in patients with high blood pressure was noticed: grade I: 23.85%; grade II: 38.53%; grade III: 32.11%. Comorbidities: Chronic kidney disease evaluated by MDRD equation was encountered in 83.49% cases; grade II 39.44%; grade IV 11.00%. Hypertrophic cardiomyopathy with echocardiographic diastolic dysfunction was presented at 36.69% patients; from these patients electrocardiographic signs of left ventricle hypertrophy were found in 1.83% cases. Diabetes mellitus appeared in 21.10% cases. From female patients 43.11% had CKD and from male patients 39.44% had CKD. According to European Score charts the patients included in our study are distributed following the next categories: low risk 4.52%; medium risk 38.53%, high risk 27.52% and very high risk 11.92%. From the total of our patients, only 68.79% had presented acid-base disorder as it follows: 5.50% metabolic alkalosis, 22.93% metabolic acidosis, 1.83% respiratory alkalosis and 38.53% respiratory acidosis. 59.63% of the patients with acid-base disorder had a medium, high or very high risk of cardiovascular disease. Hypercapnia was diagnosed in 35.77% of the patients, while hypoxia appeared in 72.47% of them. 33.02% of the patients had developed both hypercapnia and hypoxia.

**Conclusions:** The majority of the patients with hypertension and acid-base disorders had a medium, high and very high risk of cardiovascular disease. CKD was the most common comorbidity at these patients.

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**PP11.10 CARDIOVASCULAR RISK ASSESSMENT, CLINICAL CHARACTERISTICS, AND COMORBIDITIES OF HOSPITALIZED PATIENTS WITH HYPERTENSION AND ANAEMIA**

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**Objective:** The aim of the study was to assess the cardiovascular risk of the hospitalized patients with hypertension and anaemia.

**Design and method:** The retrospective study included 109 patients with hypertension and anaemia admitted to clinical emergency hospital between August-November 2016.

**Results:** The average age was 73.64 with a standard deviation 11.39. The minimum age was 43 and maximum age were 97. From 109 patients 52.29% were female and 47.70% were male. According to hypertension readings the following distribution was noticed: grade I: 23.85%; grade II: 38.53%; grade III: 32.11%. The causes of anaemia were: iron-deficiency 20.18%; macrocytic 21.10%; normochromic normocytic 36.88%; due to blood lost 9.11%. The anaemia was classified by severity in mild (haemoglobin < 10 g/dl in 25.68%), moderate (10–12 g/dl for women in 38.53% of cases and 13–15 g/dl for men in 25.68%), severe (haemoglobin < 7 mg/dl in 8.25%). Comorbidities: According MDRD equation, chronic kidney disease was encountered in 83.49%; grade II 26.60%; grade III 39.44%; grade IV 11.00%. Hypertrophic cardiomyopathy with echocardiographic diastolic dysfunction was presented at 36.69% patients; from these patients electrocardiographic signs of left ventricle hypertrophy were found in 1.83% cases. Diabetes mellitus was found in 21.10% cases. From female patients 43.11% had CKD and from male patients 39.44% had CKD. According to European Score charts the patients included in our study are distributed following the next categories: low risk 4.52%; medium risk 38.53%, high risk 27.52% and very high risk 11.92%.

**Conclusions:** The patients with hypertension and anaemia had a medium and high risk of cardiovascular disease (p = 0.04). CKD was the most common comorbidity at these patients.

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**PP11.12 THE STUDY OF SINUS TACHYCARDIA IN PATIENTS WITH HYPERTENSION ASSOCIATED WITH ASTHMA**

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**Objective:** To study the frequency of sinus tachycardia in patients with AH associated with asthma.

**Design and method:** 91 patients with mild and the average degree (1.2 degree) of AH, associated with asthma of varying degrees in the stage of control, were
involved in the study. Of them, 26 patients (29%) with AH with asthma of mild severity – group I, 17% with asthma of the degree of severe group II, 34% - with asthma of severe degree- group III. A group IV of 30 patients with AH 1,2 degree and a group V of 32 patients with separate BA were taken for a comparative analysis. All patients received the controller medication to asthma by inhaled glucocorticosteroids (IGCs) and β2-agonists short action. There was treatment of AH with tablet of indapamide 2.5 mg, and patients observed the recommendations about non-treatment AH therapy. Holter monitor ECG (HM-EGK) on GE SEER MC Marquette Medical System (USA) was performed to all subjects.

Results: The sinus tachycardia was revealed in patients group I -12% of cases, group II-18%, and in group III - 58% of cases. In patients of group IV the sinus tachycardia was detected in 10%, in group V-28%. The significant difference was between I and III groups (p = 0.002), between the groups V and III (p = 0.01), between the results of groups IV and III (p = 0.001).

Conclusions: An increase in the number of patients with AH, associated with asthma, with sinus tachycardia was revealed while bronchial obstruction progression, so that as confounding factor on influence of cardiovascular and respiratory pathology against each other.

Objective: The metabolic syndrome (MetS) is characterized by a cluster of atherothrombotic risk factors. All components of MetS in combination show a close relationship with cardiovascular events. Objective: To determine the presence, frequency and complexity of cardiac arrhythmias in individuals with hypertension (HTA) and MetS.

Design and method: The study included 150 subjects divided into two groups: the first group (I), n = 100 patients with MS based on the criteria of the International Diabetes Federation, the second (II) healthy subjects, n = 50. In all patients was done: anamnesis, laboratory analysis, anthropometric measurements, 24-h ambulatory ECG monitoring, exercise stress test, echocardiography.

Results: The presence of components MetS is more frequent in group I, p < 0.001. In the first group the most prevalent MetS components increased waist circumference and HTA (100%), in II group elevated triglycerides (56%). Heart rhythm disorders are registered in 29.33% respondents. Presence of atrial fibrillation (AF) in the whole sample was higher in males (p = 0.01) and in those older than 65 years (p = 0.05). All heart rhythm disorders prevalent in I group, a significant permanent (AF), paroxysmal AF (p < 0.01) and ventricular arrhythmia (VA), p = 0.001. Hypertensive patients was significantly higher incidence of AF, VA, but generally the presence some of a rhythm disturbances (p < 0.001). Results of univariate regression analysis showed that obesity increases the probability for the occurrence of AF 3.61 times, increasing BMI for one unit of measurement to 15%, a rise the number of components of MetS by 73%. As significant predictors for the occurrence of VES allocated to age, obesity and the number of components of MetS (p < 0.05). With statistical significance of p < 0.05 increases the probability for the occurrence of VA in obese to 3.52 times, with an increase in the number of MetS components for one, increases the probability for the occurrence of VES 55%.

Conclusions: Atrial and ventricular heart rhythm disorders are common in patients with MetS, especially AF and VA. Hypertensive patients were significantly more prevalent AF and VA. The most important parameters for the occurrence of AF and VA were obesity and the number of components of MetS.

Objective: The aim of our study was to assess the prevalence of hypercholesterolemia (HTL), obesity, hypertension, high blood pressure and isolated systolic hypertension (ISH) as cardiovascular disease risk factors among visitors of Health Centers (HC) in Russia and its regions.

Design and method: The data of 435299 men and women aged 25–64 years who visited HC in more than 20 regions of Russia from 2010 to 2015 were analyzed.

Results: The prevalence of HTL in men and women was 30.4% and 25.9% consecutively, obesity - 15.7% and 21.6%, hypertension - 19% and 15.1%. The prevalence of high-normal blood pressure among visitors of HC aged 20–85 was 17.7% and 14.4% in men and women respectively (total prevalence 15.9%). Prevalence of ISH was 6.5% in men, 8.3% in women (total prevalence 7.5%). Stage 1 ISH was observed in 16.6% of women and 16.7% of men (16.7% of sample), the prevalence of stage 2 was 5.9% in both men and women (5.9% of sample), stage 3 ISH was in 1.7% of men and 1.8% of women (1.8% of sample). HT and ISH are found to be the more common in women, hypertension - in men. Standa- 
dardized evaluation of obesity prevalence varies depending on the region from 10.3% in Kurgan region to 48.5% in Belgorod region, hypertension - from 12.4% in Kurgan region to 55.0% in Bryansk region, HT - from 24.1% in Moscow to 60.9% in Saratov region. According to the standardized evaluation the prevalence of obesity, HT and hypertension in Moscow, Kurgan region and Chuvash republic is lower than in average in Russia. Obesity in Belgorod region (48,5%), hypertension in Bryansk region (55,0%) and HT in Saratov region (60,9%) are two times more prevalent than in average in Russia.

Conclusions: Analysis of the cardiovascular risk factors in visitors of the HC in Russia revealed a favorable situation in Moscow, Kurgan region and the Chuvash Republic. However, in most regions, the prevalence of obesity, hypertension and HT is quite high, suggesting the need to enhance measures for the prevention of cardiovascular diseases, changing lifestyle and food habits, correction of therapy.
Conclusions: Highest hypertension prevalence among the three countries was in Russia and in Russian population in Kyrgyzstan. Hypertension awareness in Russia was higher. In Kyrgyzstan, hypertension awareness was lower among Russian women. Among hypertensive participants, the percentage of treated hypertension in Samara was most. In Kyrgyzstan and Kazakhstan, hypertension treatment was lower among native population. Most higher percentage of controlled BP was in Samara.

**PP.11.17 CARDIOVASCULAR DISEASE RISK FACTORS AMONG MALE YOUTHS IN SOUTHERN SWITZERLAND: A TRANSVERSAL STUDY**

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**Objective:** Cardiovascular diseases, first cause of death in Switzerland, are frequently attributable to risk factors already present in children and adolescents. The aim of this study was therefore to describe the prevalence of cardiovascular disease risk factors in 18- to 20-year-old males undergoing medical examination to assess fitness for recruitment into the army.

**Design and method:** An exploratory transversal study, approved from the regional ethic commission, was conducted during the recruitment days. The analysis included measurement of the anthropometric parameters, arterial brachial pressure, central arterial pressure and arterial stiffness (=pulse wave velocity in m/s). Moreover, a structured questionnaire addressing smoking behavior, sedentariness and familial cardiovascular risk factors, as well as blood analysis for determinations of glycaemia, lipids and Vitamin D metabolism values was performed.

**Results:** In the period between 1/4/2014–31/12/2016, 1045 voluntary were included in our study. Following cardiovascular risk factors were present in this young male population: tobacco use (N = 449, 43%), body mass index >25.0 Kg/m2 (N = 274, 26%). Abdominal circumference > 94.0 cm (N = 117, 11%); Arterial pressure = or > 140/90 mm Hg (N = 83, 8%); 25-OH-vitamin D3 rate =or <50 nmol/L (N = 201, 26%); Abdominal circumference > 94.0 cm (N = 117, 11%); Arterial pressure = or > 140/90 mm Hg (N = 83, 8%); 25-OH-vitamin D3 rate =or <50 nmol/L (N = 201, 19%); total cholesterol = or > 5.2 mmol/L (N = 54, 5%); uricaemia >500 mmol/L (N = 61, 6%); pulse wave velocity >10m/s (N = 25, 2.5%).

**Conclusions:** The results of this study allow us to analyze the cardiovascular health of young males living in Southern Switzerland. These results clearly show that a high number of young male present at least one cardiovascular risk factor.

**PP.11.18 CROSSTALK BETWEEN VITAMIN D, LDL, HIGH SENSIVITY C REACTIVE PROTEIN AND CARDIOVASCULAR RISK IN HYPERTENSIVE PATIENTS**

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**Objective:** To assess the relationship between vitamin D, LDL and high sensitivity C reactive protein (hsCRP) and cardiovascular risk in hypertensive patients.

**Design and method:** 25-hydroxy-vitamin D, hsCRP and LDL level were assessed in 30 middle-aged (47 ± 5 years) hypertensive patients. Cardiovascular risk was evaluated considering hsCRP values: high cardiovascular risk if hsCRP exceeded 0.300 mg/dL, moderate if 0.100–0.300 mg/dL and low if less than 0.100 mg/dL.

**Results:** Vitamin D, hsCRP and LDL levels were as follows: 27.16 ± 11.51 microg/L, 0.53 ± 0.49 mg/dL and 139 ± 41 mg/dL. Vitamin D was insufficient (less than 20 microg/L) in 9 patients (30%), high sensitivity C reactive protein and LDL were increased (more than 0.3 mg/dL and 130 mg/dL, respectively) in 17 patients (57%). A LDL exceeding 130 mg/dL was a specific predictor of high cardiovascular risk (specificity: 0.71, 95%CI: 0.44–0.88) and a specific predictor of moderate cardiovascular risk (specificity: 0.8, 95%CI: 0.68–0.95). Low vitamin D level was found as a specific predictor of high cardiovascular risk (specificity: 0.69, 95%CI: 0.38–0.89).

**Conclusions:** Insufficient vitamin D levels, and high LDL and hsCRP are very prevalent in middle-aged hypertensive patients, related to a high or moderate cardiovascular risk.

**PP.11.19 SYSTOLIC BLOOD PRESSURE AND PULSE PRESSURE AMPLIFICATION IN SMOKERS**

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**Objective:** To assess blood pressure (BP) and pulse pressure (PP) amplification in smokers and their relationship with arterial stiffness, coronary perfusion indexes, arterial age and data related to smoking.

**Design and method:** A total of 147 smokers, aged 37 ± 17 years, 48% male (71%) were investigated using an Arteriograph. Blood pressure variables, pulse wave velocity (PWV), augmentation indexes, arterial age (AA) and coronary perfusion indexes (DRA, DAI) were assessed. Data about smoking habits, such as number of cigarettes smoked/day and number of years as smokers (NYS) were self-reported. Smoking pack years (SPY), systolic blood pressure (SBPao/SPB) and pulse pressure amplification (PPao/PP) were calculated.

**Results:** PWV, AA, PPao/PP, SBPao/SPB, DRA, DAI were, as follows: 8.96 ± 4.93 ms, 41.16 ± 17.22 years, 0.82 ± 0.13, 0.92 ± 0.06, 51.52 ± 11.78 and 51.37 ± 4.51%, respectively. Significant correlations and associations obtained between PPao/PP, SBPao/SPB and DRA, AA, SPY and NYS, respectively. SPY and NYS were significantly associated with PPao/PP, considering results of linear regression analysis (multiple R = 0.36 and 0.43, respectively and p < 0.01). PP amplification > 0.8 and systolic blood pressure amplification > 0.9 were sensitive predictors of increased PWV (sensitivity: 0.86, 95% CI: 0.68–0.95 and 0.88, 95% CI: 0.72–0.96, respectively). SPY > 12 was a specific predictor of increased PP amplification (specificity: 0.85, 95% CI: 0.75–0.91) and a sensitive predictor of systolic BP amplification (sensitivity: 0.88, 95% CI: 0.72–0.96).

**Conclusions:** The study provides evidence that SPY, PP and SBP amplification are useful tools in smokers, in predicting increased arterial stiffness, early arterial ageing and impaired coronary perfusion.

**PP.11.20 VITAMIN D IN HYPERTENSIVE PATIENTS**

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**Objective:** To assess vitamin D level in hypertensive patients and explore its relationship with blood pressure variables and arterial stiffness.

**Design and method:** A total of 27 hypertensive patients, aged 47 ± 7 years, 63% male, were evaluated using a Mobil-O-Graph. Blood pressure variables and arterial stiffness were measured. 25-hydroxy-vitamin D level was assessed using liquid chromatography.

**Results:** Systolic, diastolic, mean arterial, central systolic, central diastolic blood pressure and pulse wave velocity were as follows: 138 ± 16 mmHg, 93 ± 13 mmHg, 114 ± 13 mmHg, 130 ± 15 mmHg, 94 ± 13 mmHg, 7.27 ± 0.69 m/s, respectively. Vitamin D level was 28.38 ± 11.65 microgram/L, decreased in 7 patients (26%). Vitamin D was found as an independent predictor of arterial stiffness, even after adjusting for blood pressure variables, and of systolic, diastolic, mean arterial pressure and central blood pressure variables.

**Conclusions:** Vitamin D insufficiency is common in hypertensive patients and provides useful prognostic information, related to blood pressure variables, arterial stiffness and cardiovascular risk.

**PP.11.21 PREVALENCE OF RESISTANT AND REFRACTORY HYPERTENSION IN FRENCH PRIMARY CARE OFFICES. RESULTS FROM THE PASSAGE REGISTRY**

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**Objective:** Since 2000, very few registries evaluated the rate of BP controlled patients in general practice in France. The PASSAGE registry, conducted in 2014, demonstrated that 51.5% of treated patients were at goal. The aim of this additional analysis was to provide a more phenotype of this population, taking into account the BP level and the number of medications, according to a recently published classification (Dudenboel T. Hypertension. 2016:67:1085).

**Design and method:** A representative sample of 1000 French practitioners was requested to include the first consecutive 20 hypertensive patients. Controlled hypertension was defined as SBP < 140 mm Hg and DBP < 90 mm Hg in patients < 80 y and SBP < 150 mmHg in patients >80 y. The recruitment period held from november 2013 to february 2014. Patients were classified in 5 categories according to their BP level and antihypertensive treatment.

**Results:** 23406 patients (mean age 66 ± 12 y; 50.7% of males) were included. 14.2% were >90yo. 47% had treated dyslipidemia and 11.6% were active smokers. Monotherapy, dual therapy were used in 48.7% and 31.8% respectively, whereas 3 treatments and more were prescribed in 16.4% of patients. Mean BP was 140 ± 16 / 80 ± 10 mmHg. According to the classification, 51.5% of patients had...
controlled hypertension, 1.9% had controlled hypertension, 40.2% had uncontrolled hypertension, 6.3% had resistant hypertension, and 0.1% had refractory hypertension.

Conclusions: This new classification makes it even better to clarify the status of blood pressure control at a population level. These findings underscore the overall therapeutic burden of hypertensive patients, who are generally under-treated, as evidenced by high rates of monotherapy, uncontrolled hypertension and low rates of resistant and refractory hypertension.

SCREENING FOR HYPERTENSION AMONG PATIENTS EVALUATING FOR FAMILIAL HETEROZYGOUS HYPERCHOLESTEROLEMIA ACCORDING TO DUTCH LIPID NETWORK CLINICAL CRITERIA

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Objective: Our aim was to analyse the presence of essential hypertension in group of patients, estimated to have familial hypercholesterolemia (FH) in population according to Dutch Lipid Network Criteria (DLNC).

Design and method: A Questionnaire based cross sectional study among young patients aged 18-60 years, was carried out in 59 patients, who were hospitalized in Department of Cardiology in period January, 2015 to February, 2015. Blood was taken for laboratory tests.

Results: We found that 3.39% (n = 2) of the patients estimated for FH according to DLNC had probable FH; 42.37% (n=25) had possible FH and 54.24% (n = 32) had unlikely FH. In group with probable FH 100 % (n = 2) of the patients had hypertension; with possible FH 8.0% (n = 2) had no hypertension, 52.0% (n = 13) had hypertension under 5 years;24.0% (n = 6) had it between 5–10 years and 16.0% (n = 4) had hypertension above 10 years. Patients in unlikely FH’s group that had no hypertension were 2 (6.25 %), with hypertension below 5 years- 5 (15.6%), between 5-10 years and 16.0% (n = 4) had hypertension above 10 years.

Conclusions: Our results showed the prevalence of patients with essential hypertension in observed group estimated according to DLNC. This can help us to determine risk patients with these two important diseases- FH and hypertension, and to prevent early disorders of target organs.

THE IMPACT OF SMOKING ON CENTRAL AORTIC PRESSURE RESPONSE TO EXERCISE IN MIDDLE-AGED NORMOTENSIVE INDIVIDUALS

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Objective: Dynamic exercise increases vascular wall shear-stress and induces peripheral vasodilatation. This may attenuate wave reflection from periphery and contribute to slight increase in central aortic pressure. However, the adverse arterial changes associated with smoking may affect the vascular reactivity during exercise. This study aimed to evaluate the impact of smoking on central aortic pressure response to exercise in middle-aged individuals.

Design and method: Seventy-four apparently healthy normotensive men (41 ± 8 years) who were free from cardiovascular disease, diabetes mellitus and renal diseases were examined. The subjects exercised for 10 min on a bicycle ergometer at a HR equal to 50% of HR reserve. At baseline, immediately and 5-min after exercise, peripheral pulse waveforms were recorded by a radial application tonometry. Pulse pressure (PP) amplification, defined as the ratio of peripheral to central PP, was used as a marker of wave reflection. Smoking status was determined by questionaire, and Brinkman Index (BI) values were calculated as the number of cigarettes smoked per day multiplied by the number of years of smoking.

Results: The subjects were divided into subgroups according to cumulative number of cigarettes smoked: never smokers (N = 36), light smokers (BI < 400, N = 20), and heavy smokers (BI of > 400, N = 18). Under resting condition, there were no significant differences in peripheral and central pressure measures and PP amplification. After exercise, however, PP amplification was the lowest in heavy smokers (1.45 ± 0.09, P < .001), followed by light smokers (1.59 ± 0.16, P = .003) and never smokers (1.65 ± 0.13) (P for trend < .001). The changes from baseline to exercise for PP amplification was significantly lower in heavy smokers than never smokers (P = .013). Multiple regression analysis revealed that heavy smoking was significantly associated with the reduced PP amplification after exercise (β = −.235, P = .011), independent of age, body mass index, blood glucose, triglycerides, and brachial systolic pressure at rest (adjusted R² = .528, P < .001).

Conclusions: Smoking has an impact on vascular reactivity and attenuates exercise PP amplification through increased wave reflection. The adverse arterial changes by smoking could be identified by an abnormal response of central aortic pressure to exercise even before clinical manifestation of hypertension.

PRESCRIPTION PROFILE

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Objective: The purpose of this study was to evaluate the antihypertensive drug profile of our patient list, in a primarily health care institution.

Design and method: We conducted an observational study by analysing the electronic clinical process of our hypertensive patients. The study sample included all patients coded with K86 (hypertension without complications) and K87 (hypertension with complications) as active problems.

Results: 316 patients were included, 59% females and 41% males. The hypertension prevalence was 16.7%. Most of the patients, 66%, were obese or had excess weight, 54% also had dyslipidemia and 29% had type 2 diabetes. 4% of the patients were controlled without the need for pharmacological treatment and 17% were controlled in monotherapy. 54% were treated with a two-drug combination and 23% with a three-drug combination regimen. 2% of the patients needed a four-drug combination treatment. The most common combinations used were calcium channel blockers (CCBs) with angiotensin receptor blockers (ARBs) (15%), diuretic with ARB (15%) and diuretic with angiotensin-converting-enzyme (ACE) inhibitor (11%). Diuretics and ARBs were the most prescribed drugs and beta-blockers the least prescribed. Of notice, among young patients, 1 was under no pharmacological treatment, 1 was under a two-drug combination and 1 was undergoing a three-drug combination treatment.

Among the elderly, the majority (57%) were medicated with a two-drug combination treatment.

Conclusions: Hypertension is an important cardiovascular risk factor. In line with published data, only a small percentage of our patients is successfully controlled in monotherapy, while the majority needs at least a two-drug combination regimen.

GENDER DISPARITIES IN SECONDARY PREVENTION- TIME TO DESPAIR?

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Objective: Post-menopausal women have a higher risk of cardiovascular (CV) events than men. We hypothesized that even after a CV event, women still receive sub optimal secondary prevention with a poorer outcome.

Design and method: We analysed the gender differences in clinical characteristics, evidence-based prescribing, targets achieved and outcome in 3000 patients, 79% male, between years 2000–2016 enrolled in a dedicated secondary prevention programme at Department of Cardiac Science, King Abdul Aziz Medical City- National Guard Health Affairs, Riyadh, Saudi Arabia. Results are expressed as mean ± SD for continuous variables and percentages for categorical data. Results are expressed as Odds ratio with 95% confidence intervals. Multiple logistic regression was used to analyse the relationship between gender and outcome, adjusting for potential confounders. Data analysed with JMP (SAS for Windows), p < 0.05 considered significant.

Results: Men were more likely to have a single CV risk factor, dyslipidemia (11% vs. 3%, OR = 4, CI 3.4-4.6), hypertension (3% vs. 1.7%, OR = 1.6, CI 1.3-1.8) diabetes (1.5% vs. 0.83%, OR = 1.8, CI 1.8-2.3) and smoking (39% vs. 3%,
OR = 22, CI 20–26). Women were more likely to have clustering of CV risk factors; (69% vs. 45%, OR = 1.7 CI 1.39–1.44) than men. Women received less coro-

nary revascularization; percutaneous coronary intervention (PCI) (51% vs. 55%, p < 0.001) and coronary artery bypass surgery (32% vs. 35%, p < 0.001) than men. Females received less statins and aspirin (all p < 0.001) with no significant difference in beta blockers (p > 0.001). Women were less likely to achieve target blood pressure; 72% vs. 78%; LDL; 37.6% vs. 46% and HbA1C; 23% vs. 35%, than males (all p < 0.0001). Mortality was significantly higher in women (3.5% vs. 1.5%, p < 0.001), associated with older age, multiple risk factors, suboptimal therapy, less coronary revascularization and higher prevalence of co-morbidities.

Conclusions: Women get a raw deal once they lose the hormonal protection; It is evident from our study and others that the traditional approach to managing CV disease in women has not produced dividends. It is time we look at other biomark-

ers to improve risk stratification as well as better understand factors that lead to more conservative management in women.

Unraveling the Uric Acid in the Cluster of Cardiometabolic Risk Factors Early in Life: A Prospective Study

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Objective: The present prospective research, starting at birth, was undertaken to analyze factors related to the uric acid in children at 5 years old.

Design and method: One hundred and fifty four Caucasians of both sexes (77 fe-

males), of European origin, born at term were included. After the initial evaluation on the second day of life, infants were followed up and growth pattern prospectively recorded. At five years, office BP measurements were performed and fasting blood sample was obtained to measure glucose, insulin, lipid profile, and uric acid. All subjects were normotensives, no diabetes neither dyslipidemia were present.

Results: In this prospective study, uric acid at five years depends positively on the increment of weight from birth (p < 0.001) and inversely of the birth weight (p < 0.05). Furthermore, uric acid was significantly correlated with current weight (r = 0.25 p = 0.003), current height (r = 0.17 p = 0.04), office SBP (r = 0.23 p = 0.005), insulin (r = 0.36 p = 0.001), and HDL (r = -0.30 p = 0.001). In a multiple regression analysis insulin, and HDL cholesterol were indepen-

dent determinants of uric acid when, sex, current weight, birth weight, SBP, and Log triglycerides were also included (r2 = 0.23). The weighted impact of uric acid on metabolic parameters and office SBP, adjusted by sex and body weight, are shown in the Table.https://services.aimgroup.at/ASPClient/files/3465/Ab-

stract/669_20170102111446.pdf

Conclusions: Uric acid is associated with metabolic parameters independent of office BP. Metabolic status at 5-year-old in children born at term may be influenced by perinatal events and postnatal rapid weight gain with clinical implications that re-

quire active intervention to prevent or reverse upward crossing of weight percentiles.

Cardiovascular Risk Profile in a Family Health Program in Rio de Janeiro – A Pilot Project

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Objective: To evaluate the cardiovascular (CV) risk profile of a young adult popu-

lation assisted by a Family Health Program unit in Rio de Janeiro – LapARC cohort study.

Design and method: This is a cross-sectional population study enrolling young adult between 20–50 years. The eligible population consisted of all 1,795 resi-

dents in Rio de Janeiro downtown, previously registered in Family Health Pro-

gram unit. This pilot project intends to evaluate 15% of the total population at this first moment. A database is being developed at the entrance of each partici-

pant into the cohort, including sociodemographic characteristics, CV risk factors (hypertension, diabetes, dyslipidemia, smoking, physical inactivity, and obesity), and previous CV diseases. All subjects were submitted to a standard protocol, including a thorough clinical examination, a laboratory evaluation, and electrocar-

diogram. Clinic BP was measured on 2 occasions with suitably sized cuffs, with patients in the supine position, using a digital BP monitor. The mean between the 2 readings was registered.

Results: A total of 270 subjects [34.2% males, mean (SD) age: 38.0(9) years] were evaluated. The distribution of socio-demographic variables revealed a medium schooling levels (12 [1–23] years), being 22% in elementary school, 60% in high school and 18% in graduation and a predominance of low personal income was observed. One third of cohort members are married (34%). Only 20% of partici-

pants did not present CV risk factor and 70% presented 1 to 3 CV risk factors. The most common condition was physical inactivity (45%), followed by obesity (31%) and smokers (18%). A total of 43 (18%) participants had previous diagnosis of hypertension and 46 (19%) of dyslipidemia. Previous CV diseases were present in 41 (17%) subjects (10% with coronary diseases). There were no differences be-

tween genders. Patients between 35 to 50 years had higher prevalence of obesity, hypertension, and dyslipidemia.

Conclusions: We found a high prevalence of modifiable (obesity, smokers and physical inactivity) and controllable (hypertension and dyslipidemia) CV risk fac-

tors for a young adult population, pointing to the importance of early CV risk strati-

fication. In this way, effective prevention measures can be planned and implemented.

Ethnic Differences in Awareness, Treatment and Control of Hypertension in Colombia

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Objective: To compare awareness, treatment and control of hypertension by eth-

nic groups in a sample of the population included in the Colombia-PURE study.

Design and method: Blood pressure was measured twice at home by trained re-

search nurses using an automated device. The average was used. Hypertension (HTN) was defined as a systolic blood pressure (SBP) of 140 mmHg or more and self-reported antihypertensive treatment or previous diagnosis of HTN. The ethnic group was established by the phenotypic characteristics of the participants and they were classified as mestizos, whites, afro-descendant or indigenous. We calculated the prevalence with the respective confidence interval (CI 95%) and differences were established with Chi-squared test.

Results: Ethnic group information was obtained from 2601 participants, 71.5% (n = 1867) mestizos, 13.9% (n = 364) whites, 13.7% (n = 357) afro-descendant and 0.9% (n = 24) indigenous. The mean of SBP was 129.2 ± 22.5 mmHg, the highest mean was 135.5 ± 23.2 mmHg in afro-descendants. The total prevalence of HTN was 37.9% (CI 95% 36.4–39.8). The highest prevalence was 44.5% (CI 95% 39.3–49.7) in afro-descendants, followed by 38.5% (CI 95% 33.5–43.5) in whites, 36.6% (CI 95% 34.5–38.8) in mestizos and 29.2% (CI 95% 10.6–47.8) in indigenous. The data was significant (p < 0.05). There was low awareness (36.1%; 0.0%), treatment (35.4%; 14.3%) and control (5.7%; 0.0%) amongst afro-descen-

dants and indigenous, respectively, in comparison to whites (45.3%;43.2%;12.2%) and mestizos (49.7%;44.1%;16.1%).

Conclusions: Afro-descendants and indigenous are considered as a social minor-

ity, condition associated with a higher prevalence of HTN and with lower percent-

ages of awareness, treatment and control of hypertension.

The Necessity of a Population Approach in Achieving Hypertension Control

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Objective: Globally, the proportion of people with undiagnosed and uncontrolled hypertension is significant. Typically, physician factors such as therapeutic inertia are cited or presumed to underlie a significant proportion of the care gap in hyper-

tension. The objective of this study was to assess the degree to which physician versus system factors contributed to the hypertension treatment gap.

Design and method: Data was obtained from the provincial medical database, the national health measures survey, as well as from quality improvement project
Results: Screening rates for hypertension in primary care for patients who visited a practice were 97%. However, screening rates for persons registered (attached) to a practice were 69%, the care gap being composed of those patients who did not visit a physician during that year. Of those patients treated for hypertension, and who regularly visited a doctor, about 80% achieved blood pressure targets. However, the overall hypertension control rate in the population was in the range of 60–65%, again with this care gap consisting of people who did not regularly see a doctor. Additionally, the greater the attachment and continuity of care with a family doctor, the lower the emergency room visit rate (\( r = -0.64 \)) and the also the greater the specialist availability to primary care, the lower the hospital admission rate (\( r = -0.52 \)). When individual practices or clinics were examined via quality improvement initiatives, an identical picture was obtained: those patients who regularly attended a specific doctor/team were much more likely to be diagnosed, treated and controlled than those whose care was sporadic.

Conclusions: In order to achieve better hypertension control, focusing on individual physician behavior will likely produce little benefit. Rather, ensuring patients have attachment, access and continuity of care with a doctor/team and that appropriate system (e.g. specialist) support is available for primary care is likely to result in much more benefit to a population.

PP.11.33 CLINICAL COMPLICATIONS OF ARTERIAL HYPERTENSION: GENDER-RELATED DIFFERENCES

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Objective: The aim of this study was to compare the incidence of subclinical organ complications between hypertensive men and women.

Design and method: A total of 82 hypertensive patients (41% women, n = 34) without known history of diabetes and coronary artery disease, were evaluated irrespectively of prior treatment with transthoracic echocardiography (TTE) and biochemical tests. TTE evaluation consisted of the assessment of left ventricle hypertrophy (LVH), left ventricle systolic and diastolic function (evaluated respectively as left ventricle ejection fraction (EF) and E/E’). Laboratory testing included serum creatinine level, microalbuminuria and urine albumine/creatinine ratio (ACR).

Results: The mean age was significantly lower in the men group (43 vs 61 years old, \( p < 0.001 \)), despite no significant difference in hypertension duration in each group (3 vs 5 years, \( p > 0.174 \)). Despite lower incidence of LVH in men (26.1% vs 51.5%, \( p = 0.032 \)), significantly lower values of E/E’ and EF were observed in this group (7.5 vs 10.0, \( p = 0.003 \); 63% vs 65%, \( p = 0.025 \)). Laboratory findings showed no difference in ACR (0.005 for both men and women), however microalbuminuria and serum creatinine were higher in men (0.69 vs 0.4, \( p = 0.002 \); 0.9 mg/dl vs 0.7 mg/dl; \( p < 0.001 \)).

Conclusions: The study results suggest that hypertensive men despite relatively lower age and LVH incidence are more susceptible to develop systolic and diastolic dysfunction as well as renal complication.

PP.11.34 THE PREVALENCE OF METABOLIC SYNDROME IN PATIENTS WITH HYPERTENSION AND ITS IMPACT ON ASYMPTOMATIC CAROTID ATHEROSCLEROSIS

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Objective: Increased cardiovascular risk in hypertensive patients might be partially attributable to metabolic disturbances. Carotid intima-media thickness (C-IMT) is a useful surrogate marker of early carotid atherosclerosis. Objective: To determine the prevalence of metabolic syndrome in patients with hypertension and its impact on asymptomatic carotid atherosclerosis.

Design and method: The study included 391 subjects, divided into two groups. The first group consisted of patients with AH, n = 342 (age: 66.56 ± 0.92, female gender: 51%). Control group consisted of the examinees without AH, n = 49. For all patients there was determined: presence of risk factors for cardio-vascular disease, SCORE risk, laboratory analyses, anthropometric measurements. MetS was diagnosed according to Adult Treatment Panel III criteria. The carotid artery intima-media thickness and carotid plaques were measured by B-mode ultrasound.

Results: The prevalence of the MetS in the first group was 58% vs.10% in the control group (\( p < 0.0001 \)). The average number of components MetS was 2.76 ± 0.53 in first group (vs.1.50 ± 0.70 in control group, \( p < 0.0001 \)). Hypertensive patients were divided into 2 groups according to the presence of MetS. Metabolic syndrome had 198 patients, there were no differences in age. Subjects with MetS had a higher average number of risk factors, SCORE risk, body mass index (\( p < 0.0001 \)), serum acid level (\( p < 0.0001 \)), more frequently had diabetes, hyperlipidemia and obesity (\( p < 0.0001 \)). C-IMT were significantly higher in the group with MetS (0.91 ± 0.21 vs. 0.81 ± 0.17, \( p < 0.0001 \)). The high C-IMC values (\( > 0.90 \)) were observed in 50.57% patients with MetS, \( p < 0.0001 \). Patients with MetS had more frequently one or more carotid plaques (\( p = 0.04 \)), higher average number of carotid plaques (\( p = 0.01 \)) and percentage of stenosis (\( p = 0.01 \)). In MetS group plaques were mostly fibrocalcified (30%), followed by fibrous (22%) and calcified, in non MetS group were mostly fibrous (36%). As the most important factors associated with carotid atherosclerosis multivariate regression analysis singled out age, number of components MetS (\( p = 0.002 \)), serum acid level (\( p = 0.0001 \)), hyperlipidemia (\( p = 0.035 \)) and obesity (\( p = 0.03 \)).

Conclusions: Hypertensive patients in a significant percentage have metabolic syndrome. Our data suggest that MetS were independently associated with subclinical carotid atherosclerosis in patients with hypertension.
**OBJECTIVE:** The aim of study was to compare blood pressure (BP) control in Ukrainian population with renoparenchymal(RAH) and essential arterial hypertension(AH) and define the factors associated with failed BP control during 3-month therapy.

**Design and method:** 9259 patients with BP>140/90mmHg were included in 3-month multicentre open trial. All patients were divided in 2 groups: 1st–2197(23.7%) patients with RAH; 2nd–7062(73.3%) with essential AH. Patients were treated by primary care physicians. On 4 visits were done: office BP measurements, ECG, patient’s compliance and cardiovascular risk evaluations by standard tests, inquiring by author’s questionnaire. Multifactor regression analysis was used for evaluation of antihypertensive treatment failure predictors.

**Results:** Patients with RAH had more complications, concomitant diseases, risk factors and target organ damage (left ventricular hypertrophy, renal dys-function). The target BP was achieved in 53.9% patients of 1st group and in 60.7% (p<0.001) of 2nd group. The mean quantity of antihypertensive drugs and combination therapy rate were more in 1st group–2.2 ± 0.02 vs 2.04 ± 0.01 (p<0.001) and 64 vs 57.1% (p<0.001). Baseline in both groups only small part of patients had high treatment compliance–20.1% and 23.5% in 1st and 2nd groups (p<0.001). We noted improvement in patient compliance in both groups on treatment, but more rate of low compliant patients was in 1st group than in 2nd at the end. In both groups poor BP control was associated with baseline systolic and diastolic BP level. Higher patient compliance at the end (but not baseline) and fruit/vegetable consumption decreased the chance of failed BP control in both groups. In patients with RAH more age and quantity of antihypertensive drugs were associated with poor BP control, while additional physical activity- with success in treatment. Heart failure and history of myocardial infarction increased and high education level of patients working status decreased the chance of poor BP control only in 2nd group.

**Conclusions:** Patients with RAH had more complications and needed more attention and aggressive BP management with other risk factor corrections. We need to use defined common and different factors associated with poor BP control for more effective antihypertensive treatment of patients with different etiology of hypertension.

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**RESULTS:** Therapy based on FDC was effective in BP lowering (office, ambula-
tory, aorta) in both groups. Baseline increased day- and night-time BP variability, morning surge of SBP and ‘non-dipper’ rate decreased in both groups, but in IHD patients these patterns were significant higher. On therapy Aix75 decreased significantly both in groups, but in 2nd group it was less in comparison with 1st group. FDC provided improving of PWVe and diastolic left ventricular function, decreasing of albuminuria, left ventricular hypertropy and left atrium size. Lowering of PWVe was significant (p<0.005) less in patients without IHD, than with IHD –2.5 ± 0.2vs4.4 ± 0.5mm/s. The positive dynamic of deltaE/A and deltaE/A’ was more in patients with IHD than in without IHD-64.4 and 54.1% vs 39.8 and 23.2% (p<0.05 for both comparisons). IMTmax decreased significantly only in patients with IHD. In group of IHD we noted significant decreasing of angina episode rate-from 2.5 ± 0.4 till 1.2 ± 0.2 (p<0.01) per week.

**Conclusions:** Thus FDC perindopril/amlopidin was effective in BP decreasing and in target organ damage regression in groups with and without IHD signs. But dynamic of target organ damage changes was some different in groups.

**REFERENCES:**
1. A. Puyo1, L. Lee1, S. Cantia, A. Donoso1, M. Choi1,2, H. Peredo1, 1Catedra de Anatomia e Histologia, Facultad de Farmacia y Bioquimica, Universidad de Buenos Aires, Buenos Aires, Argentina. 2ININCA, Buenos Aires, Argentina. 3CONI-
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**RESULTS:** Fructose-overload and high-fat diet in rats are experimental models that resemble human metabolic syndrome. This multifactorial alteration is associ-
ated to hypertension. The systemic renin-angiotensin system plays an important role in the regulation of vascular tone. Prostanoids (PR) are endogenous sub-
drances derived from arachidonic acid via the cyclooxygenases with vasoactive effects. The aim of this study was to analyze the effects of losartan (L, angiotensin1 receptor antagonist) on prostanoids (PR) release by the mesenteric vascular bed (MVb) in both models of dietary alteration.

**Design and method:** Six groups (n = 6) of male Sprague-Dawley rats were studied during 9 weeks: Control (C), standard diet (SD) and tap water to drink; fruc-
tose-overloaded (F), SD and fructose solution (10% W/V) to drink; HF diet (HF), 50% (w/w) bovine fat added to SD and tap water; C L (CL), SD + 30 mg/Kg/day L in the drinking water; F L (FL) 30 mg/Kg/day L in the fructose solution; and HF L (HFL) 30 mg/Kg/day L in the drinking water. MVbs were removed and incubated and the released PRs measured by HPLC.

**Results:** F and HF increased systolic blood pressure (SBP, mmHg, 133 ± 3, 145 ± 5 vs. C: 116 ± 2, p<0.01 and p<0.001). In the FL and HFL groups, L de-
creased SBP (102 ± 5 vs. F: 111 ± 3 vs. HF, p<0.001 and p<0.01). F diminished prostaglandin (PG) (f-keto)alpha, stable metabolite of the vasodilator prostacy-
cin (PGI2), (ng PR/mg tissue, 58 ± 11 vs. C: 98 ± 8, p<0.05) and PGE2 (ng/mg, 35 ± 7 vs. C: 87 ± 6, p<0.01). HF diet increased thromboxane (TX) B2, stable metabolite of the vasoconstrictor TXA2, (ng PR/mg tissue, 111 ± 5 vs. C: 64 ± 7, p<0.01); and PGF2alpha (150 ± 10 vs. C: 83 ± 8, p<0.01). In the FL group, L increased PG6-ketoF1alpha (117 ± 10 vs. F, p<0.05) and PGE2 (104 ± 11 vs. F, p<0.01). In the HFL group, L decreased TXB2 (66 ± 7 vs. HF, p<0.01); and PGF2alpha (90 ± 7 vs. HF, p<0.05).

**Conclusions:** In conclusion, one of the possible mechanisms by which L reduced blood pressure in these models could be an improvement of endothelial function through a regulation of PR release which produced a decrease in vasoconstriction.

**REFERENCES:**
1. N. Paskar, A. Nedoshivin. Federal Almazov North-West Medical Research Centre, Saint Petersburg, Russia.

**OBJECTIVE:** To determine the need of antihypertensive therapy in hypertensive patients with a personal risk assessment taking into consideration the 10-years development of fatal cardiovascular events (scale SCORE).

**Design and method:** Medical records of 1539 patients during 5-years period (2006–2010) were analyzed with the help of special software register. To perform this study, it was necessary to compliance with two conditions. The first condi-
Results: Analyses of outpatients in 2007 it was found in the medical cards that the majority of patients had missing data on smoking and total cholesterol, and as a consequence, the impossibility of calculating the personal risk during 10-years of fatal cardiovascular events development (scale SCORE). The need for antihypertensive therapy in patients with established hypertension was low in 2007 (17%). The need for antihypertensive therapy in 2009 was identified in 25% of patients. In 2009 it identified the need of therapy in 74% patients. Moreover, the combination therapy of three groups of drugs was observed in 46% patients. Combination therapy of two groups of drugs (ACE inhibitors or angiotensin II) and the group of calcium antagonists in 97% patients. In 2010 it identified the need in 95% patients with the calculation of personal risk, and the need for a combination consisting of three groups of antihypertensive drugs was detected in 54% patients.

Conclusions: The cohort analysis of 97% patients with arterial hypertension showed that they are defined in need of antihypertensive treatment. Combined antihypertensive therapy was administered taking into consideration the indications and contraindications for certain pharmacological groups of drugs. Thus, computer technology makes it possible not only to analyze the need for antihypertensive therapy for hypertensive patients, but also to be in demand in management of hypertension.

PP.12.08 EVALUATION OF EFFICACY AND SAFETY OF AMOSARTAN IN PATIENTS WITH ESSENTIAL HYPERTENSION: 2-YEAR, NON-INTERVENTIONAL, MULTICENTER, RETROSPECTIVE OBSERVATIONAL STUDY

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Objective: Studies have shown that combination of amlopidine and losartan resulted in significantly greater decrease in BP compared with amlopidine or losartan monotherapy in patients with essential hypertension. Amosartan is the first ARB/CBB (losartan/amlopidine) combination to be made and used in Korea, yet the safety and efficacy of chronic use has not been addressed. The objective of this study was to determine the safety and efficacy of long term Amosartan use in patients with essential hypertension.

Design and method: A non-interventional, multicenter, retrospective observational study was conducted on 1000 healthy subjects. Subjects were hypertensive patients administered with Amosartan for at least 2 years with no more than 10 consecutive weeks of withdrawal period, and the duration of Amosartan therapy being more than 80% of the total follow-up period. The change in SBP and DBP 2 years in relation to baseline was analyzed as visit-to-visit BP variability during Amosartan follow-up period. SBP and DBP was measured and charted in each visit.

Results: The percentage of patients who reached target SBP and both target SBP and DBP increased with prolonged duration of Amosartan treatment. However, there were reductions in the percentage of patients who reached target DBP at 3 months and 6 months after Amosartan treatment compared to baseline. 90% of total patients reached target SBP at 24 months after Amosartan treatment compared to 51% at baseline. 94% of total patients reached target DBP at 24 months after Amosartan treatment compared to 90% at baseline. 86% of total patients reached both target SBP and DBP at 24 months after Amosartan treatment compared to 45% at baseline. The mean SBP and DBP were consistently lower than the baseline values during the entire follow-up period after Amosartan treatment. The reduction in SBP and DBP in comparison to baseline was greatest at both 18 and 24 months after Amosartan treatment.

Conclusions: The results of this study indicate that the long-term administration of Amosartan is effective in reducing and maintaining target blood pressure in patients with essential hypertension.

PP.12.09 MASKED-UNCONTROLLED HYPERTENSION MANAGEMENT BASED ON OFFICE BP OR ON OUT-OF-OFFICE (AMBULATORY) BP MEASUREMENT (MASTER): STUDY PROTOCOL

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Design and method: MASTER study is a 4-year prospective, randomized, open-label, blinded-endpoint investigation. A total of 1240 treated hypertensive patients from about 40 clinical centers worldwide will be included upon confirming the presence of MUCH (repeated OBP <140/90mmHg, and at least one of the following: daytimeABP>135/85mmHg; night-timeABP>120/70mmHg; 24hABP>130/80mmHg). Patients will be randomized to a management strategy based on OBPM(Group1) or ABPM(Group2). Patients in Group1 will have OBPM at 0.3, 6, 12, 18, 24, 30, 36, 42, 48 months; ABPM will only be performed at randomization and at 12,24,36,48 months but will not be used to take treatment decisions. Patients randomized to Group2 will have ABPM performed at randomization and at all scheduled visits, and antihypertensive treatment will be adjusted whenever ABP exceeds normal values (Figure)

Results: MASTER will evaluate whether an ABPM-based strategy is superior to an OBP-based strategy in changing LVmass and microalbuminuria (intermediate co-primary-outcome) and in preventing CV events (secondary outcome).

Conclusions: Although the superiority of ABPM over OBP has been repeatedly shown by observational studies, key evidence from randomized intervention trials on the actual clinical value of ABPM is still missing. The results of the MASTER study will help to clarify whether an ABPM-guided treatment strategy provides a greater benefit in terms of prevention/regression of organ damage and reduction in CV events than a strategy based on conventional OBP measurements.

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Objective: Arterial hypertension is one of the major independent risk factors for stroke and coronary artery disease, as well as for cardiovascular complications, including myocardial infarction and heart failure. However, the adequate control of blood pressure (BP) remains a critical issue in the treatment of hypertensive patients in spite of a wide range of available treatments. The objective of this study was to evaluate the BP-lowering efficacy and tolerability of a single-pill combination (SPC) of perindopril arginine/amlopidine (P/A) in patients with arterial hypertension uncontrolled with previous angiotensin receptor blocker (ARB) based treatment.

Design and method: This subanalysis of PREVOSKHOOSTVO (SUPERIORITY), an open-label, observational, multicenter study (n = 1014), included 125
Russian hypertensive patients (70.4% women, mean 57.2 ± 10.0 years) with uncontrolled BP (systolic 140–179 mmHg, diastolic 90–109 mmHg) on previous treatment with ARBs as a single agent (37.6%, 74.5% of which were treated with losartan) or as a component of a two-drug combination mainly with diuretics, beta-blockers or calcium-channel blockers: SPC (22.4%) and free-combination (40%). Patients were switched to SPC/P/A at a dose determined by the physician. Office systolic and diastolic BP and BP control rate (BP < 140/90 mm Hg) were assessed at baseline and weeks 2, 4, 12 and 24.

Results: Baseline BP was 159.9 ± 8.8/93.8 ± 6.8 mmHg. Switching to SPC/P/A from previous ARB-based treatment lead to a significant (P < 0.001) decrease of systolic/diastolic BP: 143.9 ± 10.7/86.4 ± 6.5 mmHg at week 2; 134.0 ± 11.8/81.8 ± 6.6 at week 4; 129.3 ± 8.3/80.1 ± 5.6 at week 12; 125.1 ± 7.1/78.1 ± 4.7 mmHg at week 24. The number of patients who reached target BP was 24%, 61%, 75%, and 97%, accordingly, at 2, 4, 12, and 24 weeks. Treatment with SPC/P/A was well tolerated. None of the patients reported any orthostatic hypotension, cough, or peripheral edema and none were excluded due to side effects.

Conclusions: In patients with uncontrolled hypertension on previous ARB-based treatment who were switched to SPC/P/A, BP was effectively reduced and controlled in 97% of patients at 24 weeks, with a good tolerability and safety profile.

**PP.12.12 PREVALENCE OF DIETARY SUPPLEMENTS AND OVER THE COUNTER DRUG USE IN PATIENTS WITH ARTERIAL HYPERTENSION**

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Objective: Dietary supplements are frequently advertised for the natural treatment and management of many disorders. Dietary supplements (DS) and over the counter drugs (OTC) can interfere with biotherapeutic action of prescribed medication and this is of particular concern in patients with cardiovascular disease, many of whom are on long term treatment. The aim of the study was to analyze the frequency of use of DS/OTC among patients with arterial hypertension as well as factors determining its use and patients‘ knowledge about possible interactions with conventional medication. Design and method: The study was conducted in the Outpatient Hypertensive Clinic in the Tertiary Cardiac Center. Self-prepared questionnaire was administered among 151 hypertensive patients (58% females, age range 18–80 years). Regular DS/OTC use was defined as taking them at least 3 times per week.

Results: In the examined population of hypertensive patients regular use of DS/OTC was declared by 67% subjects (n = 101). The most commonly, regularly used substances were minerals and microelements (n = 61, 40%), vitamins (n = 49, 33%), and analgesics (n = 19, 22%). Responders used DS/OTC in regular use of drugs increasing the immunity (n = 19, 13%), relieving the gastrointestinal symptoms (n = 20, 14%) and modulating cognitive function (n = 9, 6%) as well as influencing the appearance of the skin and nails (n = 12, 8%). There were no differences in the frequency of DS/OTC use in relation to age, education level and income. Women are more frequent regular users of DS/OTC than men (n = 65 vs n = 36, p = 0.03). Only 36% of responders considered the use of DS/OTC with a doctor. The majority of responders (72%) is not aware of possible influence of DS/OTC on antihypertensive medication or blood pressure control. Cost of DS/OTC in 23% of responders is equal or higher than cost of prescribed drugs.

Conclusions: Two thirds of hypertensive patients are regularly using DS/OTC being not aware of their possible interactions with antihypertensive therapy and influence on blood pressure control. The perception that nonprescription therapies are unnecessary to report during medication history taking should be changed. DS/OTC are the important position in the responders budget.

**PP.12.16 THE BLOOD PRESSURE TARGET, THE MACRO- AND MICRO-VASCULAR DAMAGE IN HYPERTENSIVES TREATED WITH INHIBITING RENIN-ANGIOTENSIN-SYSTEM AGENTS**

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Objective: Recent findings suggest that a lower therapeutic BP goals (<120/80 mmHg; HRBP) than those recommended by the actual guidelines (~140–155/85–90mmHg; GLBP) are associated to a more favorable cardiovascular prognosis. Aim of the study was to highlight the association between micro- and macrovascular damage and BP values in adult hypertensives treated with ACEI or ARBs.

**PP.12.17 ANTIHYPERTENSIVE EFFICACY OF TRIPLE DRUGS FIXED COMBINATION THERAPY OF HIGH-RISK HYPERTENIVE PATIENTS**

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Objective: Evaluate antihypertensive efficacy triple drugs fixed combination of indapamide, perindopril and amlopidine in high-risk hypertensive patients during 12 weekly therapy.

Design and method: The study included 22 high-risk hypertensive patients (II-III stage of essential hypertension, ESH/ESC 2013) who were resistant to bi-combination antihypertensive therapy, in average age 56.9 ± 9.2 years. All patients were administrated fixed combination of indapamide 1.7 ± 0.61 mg, perindopril 6.54 ± 2.42 mg and amlopidine 4 ± 3.46 mg daily (Triplixam, “Servier”) within 12 weeks. Blood pressure (BP) measured by Korotkov method and 24-h ambulatory BP monitoring (ABPM) was performed.

Results: By the end of the 12-week therapy was observed significantly reduced of systolic and diastolic BP (SBP and DBP) in both ambulatory and office measurements. During the therapy office SBP reduced on 23.4 ± 5.77% (from 165.95 ± 14.73 mmHg to 126.6 ± 7.92 mmHg, p = 0.0001), and DBP reduced on 21.37 ± 7.12% (from 101.36 ± 8.88 mmHg to 79.31 ± 5.83 mmHg, p = 0.0001). 86.4% of patients were achieved a target BP level <140/90 mmHg on office measurements. The results of 24-h ABPM showed normalization rates of 24-h BP day-time and significantly reduce of nighttime BP Thus, 24-h SBP reduced from 142.55 ± 12.9 mmHg to 128.61 ± 12.65 mmHg, p = 0.0001 and 24-h DBP from 88 ± 1.0.77 mmHg to 78.61 ± 8.43 mm Hg, p = 0.002. High antihypertensive efficacy of triple drugs fixed combination characterized with significantly reduce high daily (24-h) BP variability from 18.35 ± 5.57 mmHg to 14.72 ± 3.71, p = 0.015 for SBP and from 13.86 ± 3.08 to 12.17 ± 2.44 mmHg, p = 0.043 for DBP.

Conclusions: The results of our study have shown that 86.4%-high-risk hypertensive patients achieved BP goals with normalization of 24-h ADBP indices such 24-h SBP, DBP and daily variability of SBP and DBP during 12-week therapy with Triplixam.

**PP.12.18 UPTITRATION TO FULL-DOSE PERINDOPRIL 10MG/INDAPAMIDE 2.5MG SINGLE-PILL COMBINATION IN HYPERTENSIVE DIABETIC PATIENTS WITH UNCONTROLLED BLOOD PRESSURE: PERFORMANCE STUDY SUBANALYSIS**

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PP.12.19

SWITCH TO PERINDOPRIL 10MG/INDAPAMIDE 2.5MG SINGLE-PILL COMBINATION IN HYPERTENSIVE DIABETIC PATIENTS WITH UNCONTROLLED BLOOD PRESSURE ON DUAL THERAPY: PERFORMANCE STUDY SUBANALYSIS

J. Mourad1, R. Schueller2, F. A. Allaert1, P. Minuz1, D. Treggiari1, A. Dalbeni1, B. Molesini2, R. Chignola2, G. Zoccatelli2, T. Pandolfini2.

1Department of Medicine, University of Verona, Verona, Italy, 2Department of Biotechnology, University of Verona, Verona, Italy

Objective: To describe blood pressure (BP) control rates and metabolic profile after uptitrating to full-dose perindopril arginine 10 mg/indapamide 2.5 mg (PER/IND 10/2.5) single-pill combination in hypertensive patients with type 2 diabetes (T2D) that have uncontrolled blood pressure (BP) on lower-dose perindopril arginine/indapamide in the French PERFORMANCE study.

Design and method: PERFORMANCE, a prospective observational study, included 542 doctors in France, enrolling 2746 hypertensive patients with T2D who had uncontrolled BP (>140/90 mm Hg) on a RAAS inhibitor/diuretic combination (mean age 65 ± 10 years; 62% male). This subanalysis describes BP control rate in a subgroup of patients with uncontrolled BP on lower-dose PER/IND who were uptitrated to PER/IND 10/2.5 (n = 251). Adherence was assessed using a validated self-reported questionnaire. Mean follow-up: 35 days.

Results: At baseline, BP was 156/90 mm Hg and 38.6% of patients were obese (body mass index >30 kg/m²). At day 35, BP control was 58.6%, but significantly greater in the group with good adherence vs poor adherence (64.3% vs 47.6%; P < 0.05), with 80.4% of patients self-reporting improvement in hypertension control with their new treatment and 93.2% of prescriptions renewed. Systolic/diastolic BP was reduced by 20.3 ± 10.3/11 ± 8.5 mm Hg (P < 0.0001 vs baseline). There was a significant improvement in HbA1c at day 35 (Delta -0.2%, P < 0.0001 vs baseline visit). Obesity had no significant impact on BP control.

Conclusions: Uptitrating to PER/IND 10/2.5 in patients previously uncontrolled on lower-dose PER/IND allows rapid BP control in 59% of patients within 35 days, increasing to 64% in patients who are fully adherent to treatment, and is associated with significant improvement in HbA1c. This combination, containing 2.5 mg indapamide, was more effective than combinations containing high doses of hydrochlorothiazide, and could represent an alternative to adding a third agent. This rapid BP control was maintained even in difficult-to-treat obese patients, and was associated with high patient satisfaction and renewal of prescriptions.

PP.12.20

ANTIANGIOGENIC CYSTEINE-KNOT MINIPROTEINS PRESENT IN TOMATO FRUITS AND INDUSTRIAL DERIVATIVES CAN BE ABSORBED THROUGH THE GASTROINTESTINAL MUCOSA

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1Department of Biotechnology, University of Verona, Verona, Italy, 2Department of Biotechnology, University of Verona, Verona, Italy

Objective: To describe blood pressure (BP) control rates and metabolic profile after uptitrating to full-dose perindopril arginine 10 mg/indapamide 2.5 mg (PER/IND 10/2.5) single-pill combination in hypertensive patients with type 2 diabetes (T2D) that have uncontrolled blood pressure (BP) on lower-dose perindopril arginine/indapamide in the French PERFORMANCE study.

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PP.12.21

DETECTION OF RISK FACTORS FOR AN ESCAPE OF THE ANTIHYPERTENSIVE THERAPY EFFICACY


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Objective: To determine risk factors for the escape of the antihypertensive (AHT) therapy efficacy leading to a treatment adjusting during three months after hospital discharge.

Table 1

<table>
<thead>
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<tbody>
<tr>
<td>Sex (n)</td>
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<tr>
<td>Age (years)</td>
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<tr>
<td>Duration of HT (years)</td>
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<tr>
<td>Max systolic blood pressure in life (mmHg)</td>
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<tr>
<td>Max diastolic blood pressure in life (mmHg)</td>
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<td>Count of the prescribed medications</td>
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<td>Count of the taken pills</td>
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<td>Compliance of the ratio taken/prescribed pills</td>
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<tr>
<td>Body mass index (kg/m²)</td>
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<tr>
<td>Presence of diabetes (n)</td>
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<tr>
<td>Family history of the CVD (n)</td>
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<tr>
<td>Mean 24-hour systolic BP at inclusion stage (mmHg)</td>
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<td>Mean 24-hour diastolic BP at inclusion stage (mmHg)</td>
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Design and method: The study included 59 patients with essential arterial hypertension (HT) grade 1–3, and without other cardiovascular disease (CVD), chronic kidney disease stage >3 or diabetes. Mean age was 55 ± 9 years, 29 men. Efficacy of the prescribed AHT drugs (2–3 medications from different AHT drug classes) was verified just before inclusion in the study by 24-hour blood pressure (24-BP) monitoring (using 24-BPM, BpLab) in the hospital. All included patients achieved a mean 24-BP ≈ 130/80 mmHg. We monitored AHT therapy efficacy for 3 months following hospital discharge. Compliance was assessed by monitoring a ratio of taken and prescribed pills during office visits (at the 1st and 3rd month after hospital discharge). There were AHT therapy effectiveness criteria: office BP < 140/90 mmHg (omostolic method, OMRON), home BP < 135/85 mmHg
(oscillometric method, AND), 24-hour ambulatory BPM < 130/80 mmHg (at the 1st and 3rd month after hospital discharge). In case of registering of higher levels of the BP by anyone method, we provided the AHT treatment adjusting.

Results: Patients were divided into two groups by the presence (Group1, n = 29) or absence (Group2, n = 30) of indications for the treatment adjusting. The characteristics of groups and number of significant differences are shown in the Table1. Univariate logistic regression analysis was used with the following results: odds ratio (OR) for the escape of the AHT therapy efficacy increased by 18% with increase of the mean 24-SBP in each 1 mmHg (p = 0.004, OR = 1.18; 95% confidence interval(CI) 1.05–1.33), and by 60% with increase of the levels of the FG in each 0.5 mmol/l (p = 0.02, OR = 1.60; 95% CI 1.06–2.4). In the multivariate logistic regression analysis, independent risk factors for the escape of the AHT therapy efficacy were: family history of the early CVD (p = 0.03, OR = 3.7, 95% CI 1.1–12.1) and IGT (p = 0.04, OR = 4.1, 95% CI 1.02–16.4).

Conclusions: There were detected risk factors for the escape of the AHT therapy efficacy: smoking, family history of the early CVD, IGT, level of the FG, mean 24-SBP.

PP.12.22
SILDENAFIL IN THE MANAGEMENT OF PATIENTS WITH SEVERE SYMPTOMATIC ORTHOSTATIC HYPOTENSION ASSOCIATED WITH SEVERE SYMPTOMATIC ORTHOSTATIC HYPOTENSION

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Objective: Severe symptomatic orthostatic hypotension (SSOH) is a real treatment challenge in hypertensive patients that may lead to serious consequences and hinderings reaching the blood pressure (BP) targets. Sildenafil was suggested to help in the management of these patients.

Design and method: The analysis included 20 patients with SSOH, 14 women and 6 men with a mean age of 68.9 years, treated for grade III arterial hypertension. SSOH was defined as a BP decrease of at least 40 mmHg at 3 minutes after standing, with a history of falls and/or syncope even after optimization of the fluid status and of the current treatments. Sildenafil (25 to 50 mg) was added at bedtime. The average of 2 measurements of supine and standing BP prior to and after 1 month, was recorded. The quality of life (Qol) impact was documented with the Orthostatic Hypotension Daily Activities Scale (OHDAS) and the Orthostatic Hypotension Symptom Assessment (OHSAS). The data was analyzed with the paired T-student test (two-tailed, t-test for means).

Results: The initial mean supine BP was 164.9 (systolic) and 86.4 mmHg (diastolic) with a mean orthostatic BP of 102.6 (systolic) and 62.2 mmHg (diastolic). The mean differences between supine and orthostatic BP were 62.3 (systolic) and 24.2 mmHg (diastolic). At 1 month, the mean supine BP was 141.2 (systolic; p < 0.0001) and 75.7 mmHg (diastolic; p < 0.0001) and the mean orthostatic BP was 127.1 (systolic; p < 0.0001) and 71.2 mmHg (diastolic; p < 0.0001). The mean differences between supine and orthostatic BP at 1 month were 14.1 (systolic; p < 0.0001) and 4.6 mmHg (diastolic; p < 0.0001). The initial average Qol questionnaires scores were 22.9 (OHDAS) and 27.4 (OHSAS) and improved (two-tailed; p < 0.0001) at 1 month, with an average of 11.6 points for OHDAS (p < 0.0001) and 9.2 points for OHSAS (p < 0.0001). The most common adverse effect was headache which subsided with continued use.

Conclusions: Low-dose Sildenafil reduced the supine BP values in these patients together with a beneficial impact on their orthostatic BP resulting in an improved QoL.
(10–20 mg/day) and ezetimibe (10 mg/day) on plasma levels of lipids, adipocytokines and parameters of carbohydrate metabolism in hypertensive pts with high cardiovascular risk.

**Design and method:** Methods: A total of 31 hypertensive pts with coronary artery disease or type 2 diabetes mellitus recruited in the study were randomized into two groups: pts receiving rosuvastatin therapy (Gr.1, n = 16) and pts receiving combination of atorvastatin and ezetimibe (Gr.2, n = 15). Plasma levels of glucose, insulin, leptin, and adiponectin were evaluated; HOMA-IR index was calculated.

**Results:** Average doses after 6 months of therapy of rosuvastatin and of atorvastatin were 12.5 mg/day and 13.3 mg/day, respectively. Reduction of LDL-C levels was 51.7% in Gr.1 and 51.8% in Gr.2. The increases in basal glycemia, basal insulinemia, HbA1c levels (from 6.47% [6.10–7.02%] to 6.98% [6.23–8.18%]), and HOMA-IR were found only in Gr.2 (p < 0.05 for all). Changes of leptin levels were diverse: 73% pts of Gr.1 demonstrated decrease of leptin levels, whereas 67% of pts in Gr.2 showed 57%-increase of leptin concentrations. Degree of increased basal glycemia was associated with increase of leptin levels in Gr.2 (Rs = 0.37, p = 0.034).

**Conclusions:** In case of equivalent degree of the decrease in LDL-C levels, therapy with combination of atorvastatin and ezetimibe, unlike rosuvastatin treatment, induced increases in basal glycemia, insulinemia, HbA1c, and HOMA-IR index. Our data suggest that leptin is involved in the mechanisms of adverse metabolic effects of the combination of atorvastatin and ezetimibe.
PP.13.01 ASSOCIATION BETWEEN NECK CIRCUMFERENCE, AORTIC AND CAROTID STIFFNESS IN HEALTHY ADOLESCENTS THE MACISTE STUDY

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Objective: Introduction: Obesity has a negative impact on arterial distensibility. Neck circumference (NC) is a marker of upper body adiposity and is linked to unfavourable metabolic profile among young subjects. The association between NC and arterial stiffness is unknown. We evaluated the association between NC and other measures of adiposity, with carotid-femoral pulse wave velocity (cf-PWV) and carotid stiffness (CS) in healthy adolescents.

Design and method: Methods: 431 individuals (mean age 16.9 ± 1.4y, SBP/DBP 124/67 ± 11/7 mmHg) attending the Liceo Donatelli High School in Terni, Italy, were evaluated. cf-PWV was measured with applanation tonometry (Sphygmomanometer) and also after further adjustment for age, sex and MAP (partial R = 0.13, p < 0.01), and also after further adjustment. CS was measured with Carotid Studio (Quipu): a contour tracking algorithm was applied to B-mode longitudinal scans of common carotid artery to obtain diameter changes, stroke change in lumen area (A*PP), and arterial stiffness (CS = (DC*/A*PP)^2). CS was converted (Bramwell-Hill equation) into a carotid stiffness parameter (CS = (DC*p)/1-2, p=body density) with same measurement units of PWV. Carotid waveform was calibrated to brachial MAP/DDBP. Brachial MAP was derived from brachial tonometry calibrated to brachial SBP/DDBP.

Results: Average NC was 33 ± 3 cm, average cf-PWV 4.9 ± 0.8 m/s, average CS 4.3 ± 0.6 m/s. NC, as well as other measures of adiposity (BMI, BMI z-score, waist and hip circumferences, waist-hip ratio, waist-height ratio), showed some degrees of association with both cf-PWV and CS (Table). The association between NC and CS was the only association which remained significant after adjustment for age, sex and MAP (partial R = 0.13, p < 0.01), and also after further adjustment for BMI (partial R = 0.10, p = 0.03).

Conclusions: In adolescents, NC and other measures of global and local adiposity showed significant associations with cf-PWV and CS. The association between NC and CS was independent from age, sex, MAP and BMI. Both local and systemic factors may be involved in explaining this relationship. NC may help in identifying adolescents with increased CS.

PP.13.02 DETERMINANTS OF CENTRAL HYPERTENSION IN ADOLESCENTS WITH ELEVATED BLOOD PRESSURE – PRELIMINARY RESULTS

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Objectives: Spurious hypertension (SH) is a phenomenon of elevated blood pressure assessed on the brachial artery with normal values of blood pressure in the aorta. It is assumed that the SH is not connected with target organ damage (TOD) and cardiovascular risk and should not be treated. The aim of the study was to compare clinical and biochemical parameters of SH in adolescents with arterial hypertension (AH) and SH and assess predictors of SH.

Design and method: Of 240 students in whom brachial blood pressure were measured, 64 adolescents (27 girls; 14.6 ± 0.7 years), in whom AH was diagnosed based on elevated blood pressure measured on 3 independent occasions were included to the study. Left ventricular mass index (LVMi), carotid intima-media thickness (cIMT), pulse wave velocity (PWV), central systolic (cSBP) and pulse pressure (cPP) was measured in all hypertensive children. PWV, cSBP and cPP were assessed using oscilometric device (Vicorder®).

Results: AH described as elevated both peripheral and cSBP was confirmed in 32 subjects (50%) [23 boys (62.2%) and 9 girls (33.3%); p > 0.04]. Patients with AH had significantly greater waist circumference (WC), body mass index (BMI), peripheral pulse pressure and cPP, cardiac index and stroke volume of the left ventricle compared with SH children (for all comparisons p < 0.05). Left ventricular hypertrophy (LHV) was found in 15 subjects (9 (28%) with AH and 6 (18.7%) with SH. Elevated BMI, visceral obesity and higher cPP correlated with cSBP. However, multivariate logistic regression analysis showed that the only predictor of elevated cSBP was the male sex.

Conclusions: Of all adolescents diagnosed as AH, SH was found in 50%. Visceral obesity, overweight and symptoms of the hyperkinetic circulation were associated with the diagnosis of AH, but the only predictor of AH was a male sex. However, finding of LHV in 18.7% of subjects with SH needs further studies.
Objective: To analyze birth weight (BW) and its association with blood pressure (BP) and body mass index (BMI) of 10 to 15 year old students of public schools in Brazil

Design and method: Cross-sectional study. A total of 1,723 students were evaluated in the school environment: 743 (43.1%) males and 980 (56.9%) females (F). The distribution of the population by age and gender was: 10 yo (n = 108, 49 M / 59 F), 11 yo (n = 242, 106 M / 136 F), 12 yo (n = 368, 197, 161 M / 236 F), 13 yo (n = 346, 153 M / 193 F), 14 yo (n = 262, 105 M / 157 F). BP was measured three times by oscillometric method with OMRON HEM-1720 automatic monitor and the BMI calculated from the weight and height. BW was obtained through information provided by the parents or the guardians. The students were divided into tertiles referring to birth weight: first tertile (T1) < 3000 g; second tertile (T2) > 3000 g and < 3450 g; and third tertile (T3) ≥ 3450 g.

Results: Systolic BP means were not statistically different comparing BW tertiles (T1: 108.84 ± 11.93 mmHg; T2: 108.23 ± 11.06 mmHg; T3: 107.78 ± 10.22 mmHg) (p = 0.315); Diastolic BP means did not show statistically significant differences between the tertiles of BW (T1: 63.37 ± 10.77 mmHg; T2: 62.67 ± 9.04 mmHg; T3: 62.84 ± 8.83 mmHg) (p = 0.503); BMI means were statistically different between the groups, the mean of T3 being greater than T1 (p = 0.008) (T1: 20.49 ± 4.28 kg / m²; T2: 21.13 ± 4.58 kg / m²; T3: 21.31 ± 4.24 kg / m²). Comparison of students with BW ≤ 2500 g (low BW, n = 373) and BW > 2500 g (normal BW, n = 1292) showed lower BMI mean (p = 0.043) and higher BP mean (not significant) in the low BW group.

Conclusions: Students aged 10–15 years with lower BW had higher BP, but with no statistical significance. However, greater birth weight was significantly associated with higher BMI in adolescence.

Objective: To compare blood pressure (BP) and height by age and gender in two samples of students aged 10 to 15 years obtained with a 30 years interval (1967–2017) from the same public schools from Brazil

Design and method: Results from two cross-sectional studies were compared. Students were evaluated at their schools in 1967 and 2015/6. BW was measured three times. High BP was defined when systolic BP (SBP) and/or diastolic BP (DBP) on the third measurement was ≥ p95 for age, gender and height percentile. High BP was further categorized into three subtypes (isolated systolic hypertension [ISH], combined systolic/diastolic hypertension [SDH], and isolated diastolic hypertension [IDH]), and proportions of each hypertension subtype were evaluated. Categorical variables were compared with chi-square test and continuous variables with t-student test.

Results: 3.456 students were enrolled in 1967 (49.3% males) and 1892 students in 2015/6 (47.3% males). Mean SBP increased among males aged 11 and 12 years (p < 0.03), but decreased in females aged 10,11,13,14 and 15 years (p = 0.02), while mean DBP increased in males 10–14 years old (y/o) (p = 0.05), and females 10–12 yo (p = 0.01). Height increased between males aged 10–14 years (p = 0.02) and females aged 11–14 years (p = 0.01). The prevalence of high BP decreased over the period (11.1% ≤ 8.4%, p = 0.001), ISH was the most common presentation in both evaluations but more prevalent 30 years ago (78.9% vs 55.3%, p = 0.0001), although ISH and SDH were more prevalent in the contemporary analysis (9.6% vs 3.5% and 10.4% vs 0.1%, respectively, p = 0.0001). When stratified by age and gender, the reduction of high BP prevalence remained significant only for girls 13–15 y.o (p = 0.007).

Conclusions: Over a 30-year period, there was a significant reduction on the overall prevalence of high BP among Brazilian students aged 10–15 years. When stratified by age and gender, the reduction of high BP remained significant only for females students aged 13–15 years. The analysis of high BP subtypes showed an increase of SDH and IDH, but ISH remained as the most prevalent.

Objective: The childhood obesity is one of the most important public health problem in the last years. There is an increasing prevalence of obesity among children and adolescents. The family doctor can diagnose, manage and monitor the majority of the overweight and obese children. The objective of this study is to evaluate the influence of the excess weight, represented by the BMI as a dependent variable, upon the clinical and blood tests parameters, using a regression model.

Design and method: The observational study monitored 156 individuals: 78 overweight and obese children (39 girls) and 78 healthy children (39 girls) who served as a control group, in the evidence of the family medicine practice during 2015. We recorded the family and personal medical history and performed the clinical examinations and blood tests (blood sugar, lipids levels) in every patient.

Results: The average age of the excess weight children group was 12.6 ± 0.5 years vs. 11.6 ± 0.3 years in the healthy children group (the average age of the entire groups was 11.6 ± 0.4 years). The overweight and obese children with a birth weight less than 2500 g had a higher average BMI, with an estimate risk 1.95 (95%CI 1.01–2.24). The systolic blood pressure values were higher in the overweight and obese children group vs healthy children group (p < 0.001). Between the average of diastolic blood pressure values and the BMI values was a significant correlation (p < 0.001). The uric acid level was higher in the excess weight children group (p = 0.007). The average plasma serum glucose was also higher in the excess weight children group (p = 0.05).

Conclusions: We have found a significant correlation between BMI values and low birth weight, systolic and diastolic blood pressure values, uric acid level and plasma serum glucose. The average of cholesterol level was higher in the excess weight children group. We have found a significant relation between cholesterol and BMI in both groups. Excess weight children are likely to develop cardiovascular diseases or diabetes.
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**Objective:** Ambulatory blood pressure monitoring can be useful to detect high blood pressure phenotypes (HBPP) associated with future hypertension. The aim of this study was to determine the HBPP in a population of Hispanic adolescents.

**Design and method:** It was conducted a cross-sectional study in Maracaibo, Venezuela that included 1046 adolescents, 570 males and 476 females, selected from high school institutions (age: 13–18 years old), who were underwent 24-h ambulatory blood pressure monitoring to obtain ambulatory BP during 24-hour and asleep periods. Demographic (age, gender), anthropometric data [weight, height, hip circumference, waist circumference (WC)] and office BP were recorded. The HBPP included: sustained (SH) white coat (WCH) and masked (MH) hypertension. Prevalence and its 95% Confidence Intervals (95% CIs) were obtained for HBPP in all adolescents, by gender and by age-group. ANOVA was applied to study the effects of the HBPP in the following parameters: age, anthropometric data and BP levels.

**Results:** The HBPP prevalence in all adolescents was: 4.4% [95% CIs: 3.2–5.6, n = 26], for SH, 46.3% [95% CIs: 43.3–49.3] for MH and 0.9% [95% CIs: 0.3–1.5] for WCH (p < 0.05). Male adolescents showed statistically significant high prevalence of MH and SH than female group [(90.5% vs. 9.3% for MH) and (8.6% vs. 0.9%) for SH. On the other hand, all adolescents with WCH were females. There are not any statistically significant differences in the HBPP between age-groups (13–15 and 16–18 years old). The adolescents with WCH showed statistically significant higher values than those with MH in BMI [26.6 ± 7 vs. 22.2 ± 4 kg/m2, p = 0.0001], hip circumference [100.2 ± 15 vs. 90.8 ± 10, p = 0.0001] and WC [81.6 ± 17 vs. 74.8 ± 10, p = 0.0001].

**Conclusions:** There is a very high prevalence of MH in Hispanic adolescents; this condition appears to be associated with male gender. The WCH is associated with females and abnormal anthropometric parameters which places them in cardiovascular risk at an early age. This study shows that it is very important to evaluate the ambulatory blood pressure in adolescents in order to detect subjects in high risk for future hypertension.

### PP.13.15 LATE AORTIC ANEURYSM AND STENT FRACTURE SECONDARY TO SEVERE ARTERIAL HYPERTENSION IN CORRECTED COARCTATION AND CHRONIC RENAL FAILURE

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**Objective:** Aortic stent rupture with concomitant aortic aneurism resulting from arterial hypertension has not been described as yet. A patient, now aged 24 years, with coarctation has been operated at the age of three weeks with an end to end anastomosis of the aorta. Because of a residual stenosis the toddler has been re-operated a day later. The procedure has been further complicated by renal failure with subsequent temporary hemodialysis.

**Design and method:** During the following years, arterial blood pressure has remained within the normal range, showing a gradient of 10 mmHg. From 2006 onwards, the patient has developed arterial hypertension, which has been difficult to cope with despite multiple antihypertensive medication. During this time, renal function has been constantly reduced with creatinine around 2.1 mg/dl and a reduced glomerular filtration rate. In 2006, MR-Angiography of the aortic arch showed a hypoplastic segment of several centimeters. This observation led to an implantation of a CP-stent in order provide more stability to the hypoplastic aortic segment. Six months later, MR-angiography and chest x-ray revealed a correctly positioned, intact stent.

**Results:** Until 2012 MR-Angiographies have been avoided because of the progressive renal dysfunction, which culminated in evaluation for renal transplantation (creatinine 6.2 mg/dl). Native MR-Angiography revealed an aortic aneurism within the stented segment and chest x-ray showed in the same region several stent fractures. Subsequently, the aortic segment with the stent has been surgically removed and replaced by a prothetic inter-ponate. Postoperatively, the patient had been subjected to hemodialysis for a week and renal transplantation has been postponed.

**Conclusions:** In summary, it is likely that the development of both renal failure and the aortic aneurism has been enhanced and aggravated by the severe, drug resistant hypertension. It remains to discussion whether or not stent fracture has been also been facilitated by severe hypertension.

### PP.13.13 FIBROMUSCULAR DYSPLASIA – THE REASON OF SEVERE RENOVASCULAR HYPERTENSION IN NEWBORN

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**Objective:** Fibromuscular dysplasia (FMD) is a non-atherosclerotic, non-inflammatory disease of the blood vessels that causes abnormal growth within the wall of an artery. The most common arteries affected are renal and carotid arteries. FMD predominantly affects middle-aged women, but has been found in men and people of all ages. Pediatric cases of FMD are vastly different from that of the adult population.

**Design and method:** The aim of this report is to present a newborn girl with severe arterial hypertension (HT) caused by bilateral renal arterial stenosis due to FMD.

**Results:** Newborn girl (23 days old) was admitted to the intensive care unit with respiratory insufficiency and arterial hypertension (120/89 mmHg). Coarctation of aorta was excluded (echocardiography). Abdomen ultrasound (US) with Doppler, 3D spiral computer tomography (CT) revealed critical stenosis of the left renal artery. The following renal scintigraphy showed lack of filtration in the left kidney. The patient received pharmacological treatment (amlodipine, propranolol) and was scheduled for a nephrectomy. Five months later, the operation was performed and the pathology assessment described ‘FMD-like lesions’ in the renal vessels. Due to gradual increase of blood pressure in the one month postoperative follow-up, US and angiography were carried out. Longitudinal stenosis of the right renal artery was confirmed and the child was qualified for the percutaneous transluminal angioplasty (PTA). During the procedure persistent irreversible spasm of the renal artery occurred and it resulted in emergency autotransplantation of the right kidney. Since there was no blood flow few hours postoperatively, the nephrectomy was necessary. The patient from then on been successfully treated with renal replacement therapy (firstly hemodialysis, then peritoneal dialysis). At the age of 15 months, the child does not need hypertensive pharmacotherapy and is qualified for kidney transplantation.

**Conclusions:** 1. FMD in young children can be reason of severe renovascular hypertensive. 2. Invasive treatment (PTA, surgery) in this cases is very difficult and risky.
POSTER SESSION

POSTERS’ SESSION PS14: HEART

PP.14.03 HAEMODYNAMICS OF HYPERTENSION
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Objective: Hypertension can be classified as due to elevated peripheral vascular resistance, cardiac output, total body water, or a combination of these factors. Impedance cardiography has been shown to reliably determine these parameters in Caucasians. This study tries to establish the haemodynamic pathophysiology of hypertension of the multi-ethnic Singaporean population.

Design and method: In an ongoing cross-sectional study, 45 consecutive patients presenting to a specialist hypertension clinic were assessed using the NICAS (NI Medical) device for impedance cardiography. Hypertensive patients were considered vasoconstricted if the Cardiac outPut Index (CPI) was <0.75 w/m², and Total Peripheral Resistance Index (TPRI) <2,650 dynes x sec/cm² cm², and were hyperdynamic with TPRI> 2,650 dynes x sec/cm² cm². Patient characteristics for each class are described.

Results: 35/45 (78%) patients were hypertensive. Of these, 16 (44%) were vasoconstricted, 10 (22%) hyperdynamic, and 9 (20%) showed mixed haemodynamics. Significantly different patient characteristic was only age, with average age of vasoconstricted patients being 57 ± 20 years, mixed haemodynamics 47 ± 17 years and hyperdynamic patients 30 ± 13 years. Haemodynamic parameters are shown in table 1.

Conclusions: The findings of this study will have broad implications for the general population with undiagnosed AF.

PP.14.05 LEFT VENTRICULAR DYSFUNCTION IN PATIENTS WITH LEUKEMIA BEFORE CHEMOTHERAPY
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Objective: The aim of this study was to investigate left ventricular (LV) function and correlate with cardiovascular risk factors in patients with leukemia before chemotherapy using conventional 2-dimensional (2D), pulsed tissue Doppler (PTD) and two-dimensional longitudinal strain echocardiography (2-DST).

Design and method: We enrolled 20 patients diagnosed with leukemia aged 33–79 years evaluated for chemotherapy compared with 10 healthy control patients. Systolic (SBP) and diastolic blood pressure (DBP), heart rate (HR), Body mass index (BMI) were measured and Hemoglobin (Hb), Hematocrit (Ht) were analyzed before chemotherapy. The echocardiography 2D, PTD, 2-DST were performed prior to treatment and calculated Left Ventricular Ejection Fraction (LVEF), fractional shortening (FS), tissue Doppler peak mitral annulus systolic velocity (S), Mitral annular plane systolic excursion (MAPSE) and global systolic longitudinal myocardial strain (GLS) and correlated with cardiovascular risk factors.

Results: From all study patients, 8 (40%) are smokers and 4 (20%) with pathologic LVEF (%) <50 before treatment. Hb (g/dl) was significantly decreased from 13.49 ± 1.21 to 8.49 ± 1.87 (p < 0.001) in study group than controls. There was significant decrease in LVEF (%) and MAPSE (mm) from 63.10 ± 7.43 to 55.2 ± 6.22 respectively from 16.30 ± 2.45 to 12.70 ± 2.77 (p = 0.05). There was significant increase in FS (%) and S (mm/s) from 31.10 ± 4.50 to 40.61 ± 9.38 respectively from 0.09 ± 0.01 to 0.11 ± 0.03 (p = 0.05) and no significant difference in GLS, SBP, DBP. There were 9 (45%) patients with lymphoblastic leukemia with LVEF (%) and MAPSE (mm) significantly decrease (p < 0.05) in study patients than control. There were 9 (45%) hypertension and 4 (13.3%) coronary patients with significantly decrease in LVEF (%) (p < 0.05) and slightly decrease values in GLS (%) than controls. GLS (%) slightly decrease and LVEF (%) significantly decrease (p = 0.05) in hypertension than smokers patients.

Conclusions: The findings of this study will have broad implications for the general population with undiagnosed AF.
Conclusions: In patients with leukemia LV function should be assessed at baseline with 2D, PTD and 2-DST echocardiography before starting chemotherapy and repeated assessments during and after treatment, should also be considered. Combining 2D, PTD and 2-DST echocardiography can give complementary results in detecting LV dysfunction before clinical signs. At the beginning of chemotherapy should be given special attention to patients with cardiovascular risk factors.

**PP.14.06**
REACHING THE TARGET BLOOD PRESSURE LEVELS AND HEART RATE IN PATIENTS AFTER ACUTE DECOMPENSAED HEART FAILURE IN THE CONVENTIONAL OUTPATIENT PRACTICE AND SPECIALIZED APPROACH IN THE TREATMENT OF CHRONIC HEART FAILURE


Objective: To achieve target levels of blood pressure (BP) and heart rate in patients after acute decompensated heart failure (ADHF) in the conventional outpatient practice and specialized approach in the center of treatment of chronic heart failure (HF).

Design and method: A comparison of patients with heart failure who have been discharged from hospital after ADHF and decided to be observed in a center for HF treatment (gr 1) and patients who refused to be observed in HF treatment center continued to be observed in other outpatient settings (gr 2). Observation 8 months: gr 1 (n = 244) and gr 2 (n = 243). Hemodynamic performance, compliance to self-control of BP and heart rate in group 1 were investigated directly in the monitoring of patients.

Results: The mean age of patients in gr 1 - 70.1 + 10.4 years and 72.5 + 2 gr 11.8 years (p = 0.06) for CHF FC Gr Distribution was as follows: Gr 1 - I FC 15.4%, II FC 30.2%, III FC 41.6% and 12.8% FC IV patients and in Gr 2 - I FC 17%, II FC 43.9%, III, and 46.4% FC IV, 7.2% of patients. Stored in group 1 EF, intermediate and special detected in 68.6%, 18.5% and 12.9% of cases, while in gr 2 - in 68.6%, 21.6% and 8.9%, respectively. The average systolic BP (SBP) in gr 1 at inclusion in the follow-up of 134.8 ± 23.9 mm Hg, while in gr 2 - 141.1 ± 27.3 mm Hg (P = 0.07). After 8 months of observation in gr 1 achieved a significant decrease in SBP to 130.8 ± 18.4 (P = 0.043) and gr 2 SBP 8 months unchanged (142.4 ± 33.3, p = 0.8).

Conclusions: When viewed in a specialized facility patients after discharge from ADHF maintain high compliance to self-control of BP and heart rate. In the absence of outpatient specialized care for patients with chronic HF BP and heart rate did not reach the target values. The observation conditions in CHF treatment center level of SBP and heart rate of patients reaching target values.

**PP.14.07**
LONG-TERM CHANGES IN LEFT VENTRICULAR GEOMETRY IN TREATED HYPERTENSIVE PATIENTS

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Objective: To identify risk factors related to changes on left ventricular (LV) geometry in treated hypertensive patients after a mean period of 10 years.

Design and method: 114 patients were examined initially and after 10 years. All patients underwent echocardiography, 24-h ambulatory blood pressure (BP) monitoring and measurement of fasting and postprandial immunoreactive insulin concentration on 60 and 120 min of standard oral glucose-tolerance test (OGTT). During 10 years patients have been treated by their primary care doctor with different antihypertensive drugs.

Results: Initially the number of patients in 1st group with normal LV mass index (LVMI) and in 2nd group with LV hypertrophy (LVH) were 52 (46%) and 62 (54%), respectively (Table). Among patients without LVH the prevalence of normal geometry was 29% and concentric LV remodeling was 17%. In 2nd group 26 (31%) patients had eccentric LVH. At the end of study the amount of patients with LVH increased to 95 patients (83%), predominantly it was patients (62%) with concentric LVH. After 10 years in 26 (50%) patients from 1st group was formed concentric LVH. In both groups average 24-h BP has been reduced, but BP goal rates haven’t been achieved. Multiple regression analysis demonstrated that baseline 24-h SBP index was predictor of LVMI (β = 0.461, r = 0.01) and IVS (β = 0.543, r = 0.0001), baseline night-time SBP was predictor of PWT (β = 0.441, r = 0.0001) and baseline night-time DBP was predictor of RWT (β = 0.273, r = 0.03) and d plasma insulin concentration at 120 min of OGTT (β = 0.364, p = 0.03) had prognostic value of LVMI.

**PP.14.08**
COULD HYPERTENSION IMPROVE PROGNOSIS IN HEART FAILURE?

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Objective: It has been suggested that higher blood pressure could be beneficial in HF patients. This might be related with a better functional cardiac reserve in case of high BP. Objective: to analyse the prevalence and prognostic value of hypertension in patients admitted to the hospital due to Acute HF (AHF).

Design and method: The clinical records of patients, admitted in Internal Medicine due to AHF, during three years, were reviewed. The characteristics of patients-episodes were registered and key indicators of performance. Hypertension was diagnosed based on the personal history of hypertension. Logistic regression models were used to study clinical variables related with death or readmission.

Results: The study sample included 188 episodes. One hundred and fifty-nine patients had only one episode during the period of study, whereas 10 had two hospitalizations and 3 three hospitalizations. Median age 80y, predominantly women (56.4%), with EF (68.8%) and with multiple morbidities. As it was expected, CVRF were the main associated comorbidities followed by respiratory diseases, CKD and chronic anaemia. Hypertension was the most frequent CVRF, 142 (82.5%) followed by type 2 diabetes, 100 (58.1%) and dyslipidaemia, 84,
(48.8%). The most prescribed antihypertensive drugs were diuretics (81.4%), followed by ARBs (41.5%), beta-blockers (35.5%) and CCB (34.9%). Thirty patients died during the hospitalization (15.9%). Deceased patients were significantly older than survivors (81.8y vs 78.1y, p-value = 0.043). In the logistic regression models, the main factors significantly associated with mortality during the hospitalization were to have had a previous episode of hospitalization during the past six months [OR 2.33 (1.04–5.19), p-value = 0.038], especially in the past three months [OR 3.02 (1.34–6.81), p-value = 0.007] and older age [OR 1.65 (1.00–1.11), p-value = 0.046]. Hypertension appeared as a highly significance protective factor not only in the univariate but also in the multivariate models [OR 0.20 (0.07–0.53), p-value = 0.001] whereas there was not association for the case of rehospitalisation of mortality after one year.

Conclusions: Previous diagnosis of hypertension or high blood pressure could be of protection against in-hospital mortality in HF patients but further studies in this setting are needed to better clarify this association.

PP.14.09 DIFFERENTIAL MICRORNA-21 AND MICRORNA-133 GENE EXPRESSION LEVELS IN PERIPHERAL BLOOD MONONUCLEAR CELLS FROM HYPERTENSIVE PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION

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Objective: MicroRNAs (miRs) are essential regulators of gene expression implicated in cardiovascular function and disease. MiR-21 and miR-133 have been shown to play a role in heart hypertrophy and fibrosis. They have also been shown to regulate proliferation and phenotypic switch of vascular smooth muscle cells. However, there are limited data regarding their role in left ventricular (LV) diastolic dysfunction. The aim of this study is to investigate miR-21 and miR-133 levels in peripheral blood mononuclear cells in patients with heart failure with preserved ejection fraction (HFpEF).

Design and method: We included 48 hypertensive patients with symptoms and signs of heart failure who had an LV EF > 50% and evidence of LV diastolic dysfunction. The aim of this study is to investigate miR-21 and miR-133 levels in peripheral blood mononuclear cells in patients with heart failure with preserved ejection fraction (HFpEF).

Results: MiR-21 levels were found to be higher (4.8±0.5 versus 2.05±0.31, p<0.05), while miR-133 levels were found to be lower (13.6±7.9 versus 13.03±8.18, p<0.05) in patients with HFpEF compared to healthy controls. MiR-21 levels showed strong positive correlations with E/e’ ratio (r = 0.43, p<0.001) while miR-133 levels showed strong negative correlations with E/e’ ratio (r = 0.41, p<0.001).

Conclusions: MiR-21 and miR-133 levels in PBMCs differentiate in patients with HFpEF compared to normal individuals. In addition, they show a strong relationship with LV diastolic dysfunction in those patients. Our findings contribute to the understanding of pathogenesis of HFpEF and might offer a future therapeutic target.

PP.14.10 CARdioVASCular REMODELING IN MILD HYPERTENSION: THE ROLE OF URIC ACID

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Objective: It has been observed in animal models that uric acid can induce the growth of cardiomyocytes and the development of interstitial fibrosis. However, few clinical studies have shown conflicting results about the relationship between serum uric acid levels and left ventricular mass (r = 0.24, p = 0.001) and relative wall thickness (r = 0.168, p = 0.01) suggesting a possible role of uric acid in the development of concentric geometry. We showed a significant correlation between 24 h SBP and 24 h DBP with SUA (p = 0.001 and p = 0.04). In a multivariate analysis we confirmed the correlation of left ventricular mass with 24 h SBP (beta = 0.169, p = 0.05) and SUA (beta = 0.240, p = 0.007). No correlation was found between SUA and carotid IMT, thoracic (root and ascending) and abdominal aortic diameters.

Conclusions: In conclusion, our results may suggest a possible role of uric acid in the onset of structural and functional remodeling of left ventricle. Thoracic and abdominal aortic diameters and carotid IMT did not show any correlation with uric acid. These data need further confirmation in prospective studies.

PP.14.11 ELECTROCARDIOGRAPHIC PREDICTORS OF ATRIAL FIBRILLATION IN NORMOTENSIVE AND HYPERTENSIVE INDIVIDUALS

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Objective: To study whether the predictive value of electrocardiographic (ECG) abnormalities for atrial fibrillation differs between normotensive and hypertensive individuals.

Design and method: We recorded a standard 12-lead ECG and measured blood pressure and other cardiovascular risk factors in a nationwide population sample of 5813 Finns in 2000–2001. We divided the participants into normotensives (blood pressure < 140/90 mmHg, n = 3148) and hypertensives (blood pressure ≥ 140/90 mmHg or use of antihypertensive medications, n = 2665). We followed the participants for incident atrial fibrillation events using nationwide register data. We evaluated the predictive ability of 8 ECG abnormalities for atrial fibrillation in normotensive and hypertensive individuals using Cox regression models adjusted for baseline age, sex, body mass index, smoking, diabetes, coronary heart disease, heart failure, use of chronotropic medication, and heart rate. We tested for interaction between ECG abnormalities and hypertension status.

Results: During a mean follow-up of 11.9 ± 2.9 years, 412 participants had ≥1 atrial fibrillation event. Prolonged PR interval predicted atrial fibrillation (Figure) in both normotensive (hazard ratio [HR], 2.47; 95% confidence interval [CI], 1.26–4.85; P = 0.009) and hypertensive participants (HR, 1.57; 95% CI, 1.08–2.28; P = 0.039). In normotensive participants, a 20ms increase in corrected QT interval (HR, 1.45; 95% CI 1.15–1.83; P = 0.002) and positive T-wave in lead aVR (HR, 4.06; 95% CI, 1.72–9.58; P = 0.001) were related to atrial fibrillation. In hypertensive participants, left ventricular hypertrophy by Sokolow-Lyon criteria were compared to normotensive. Univariate analysis showed a significant correlation between serum uric acid levels and left ventricular mass (r = 0.24, p = 0.001) and relative wall thickness (r = 0.168, p = 0.01) suggesting a possible role of uric acid in the development of concentric geometry. We showed a significant correlation between 24 h SBP and 24 h DBP with SUA (p = 0.001 and p = 0.04). In a multivariate analysis we confirmed the correlation of left ventricular mass with 24 h SBP (beta = 0.169, p = 0.05) and SUA (beta = 0.240, p = 0.007). No correlation was found between SUA and carotid IMT, thoracic (root and ascending) and abdominal aortic diameters.

Conclusions: In conclusion, our results may suggest a possible role of uric acid in the onset of structural and functional remodeling of left ventricle. Thoracic and abdominal aortic diameters and carotid IMT did not show any correlation with uric acid. These data need further confirmation in prospective studies.
Laboratory Predictors of the Risk of Adverse Outcomes in Unstable Angina and Arterial Hypertension

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Objective: To determine the independent laboratory predictors of the risk of adverse outcomes in patients (pts) with unstable angina (UA) and arterial hypertension (AH) of 36 months follow-up.

Design and method: The study involved 199 pts with UA: 1 group (G1) (mean age 56.2 ± 6.2 years) consisted of 77 (38.7%) pts without AH; group 2 (G2) included 122 (61.3%) pts with AH (mean age 57.8 ± 5.4 years). All pts underwent a general analysis of blood, levels of carbohydrates enzymes, CRP, BNP, myeloperoxidase (MPO), von Willebrand factor (vWF), thrombin generation test, aggrecanogramma with analyzer Multiplate at baseline, after 6, 12 and 18 months of follow-up, ECG, EchoCG, Holter ECG, ABPM, coronary angiography at baseline and deterioration.

Results: During stationary phase of the treatment coronary stenting done to 15 (19.5%) pts in the G1 without AH and 31 (25.4%) pts in G2 with AH. During 36 months of follow-up Q myocardial infarction occurred in 3 pts (3.9%) of G1 and in 22 pts (18%) from G2; coronary bypass performed in 6 pts (7.8%) from G2. The value of AUC ADP-test > 60U is a unified laboratory predictor of complications for pts with and without AH. Independent laboratory predictors of adverse outcomes in pts with UA and AH are the baseline levels vWF, MPO, the volume of platelet MPV.

Conclusions: Prolonged PR interval predicts incident atrial fibrillation in both normotensive and hypertensive individuals. The predictive value of ECG abnormalities for atrial fibrillation seems to differ in normotensive and hypertensive individuals only for corrected QT interval.

Effects of Amiodarone and Sotalol on Left Ventricular Diastolic Function and Ventricular-Arterial Coupling Parameters in Patients with Atrial Fibrillation

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Objective: Deterioration of ventricular-arterial coupling (VAC) might be the leading cause of left ventricular diastolic dysfunction (DD) and therefore developing atrial fibrillation (AF). The effects of class III antiarrhythmic drugs on VAC and DD remain unclear. We tried to compare the effects of amiodarone and sotalol on left ventricular diastolic function and VAC parameters in patients with paroxysmal or persistent AF and left ventricular DD.

Design and method: Sixty patients [45% male, median age 65 (61; 72) years] with recurrent AF and mild to moderate DD were enrolled in this study and treated with 200 mg of amiodarone (A group) + 50 mg of metoprolol daily (n = 30) or 160 mg of sotalol (S group) daily (n = 30). All the patients underwent Doppler echocardiography and speckle tracking analysis. To assess VAC arterial elastance index (EaI), left ventricular end-systolic elastance index (EesI), Ea/Ees, systemic vascular resistance index (SVRI) and total arterial compliance (TAC) were calculated. The duration of the follow-up period was 3 months.

Results: A similar change in most clinical and echocardiographic parameters was observed in both groups. EaI significantly decreased in the two groups (from 1.41 to 1.25 in A group and from 1.7 to 1.6 in S group, p for all < 0.001), while TAC increased (from 1.15 to 1.35 in A group and from 1.11 to 1.4 in S group, p for all < 0.001). There was no significant change in Eal in A and S groups; similarly, SVRI was stable during the observation. The improvement of left ventricular longitudinal strain (6.19 vs 0.81, p = 0.001), left atrial (LA) size (6.2 vs 1.1, p = 0.02), deceleration time (6.2 vs -1.0, p < 0.001), E/A ratio (6.0 vs -0.18, p = 0.08) and E/E' (7.0 vs -0.27, p = 0.008) was significantly more pronounced in A group.

Conclusions: While the arrhythmogenic qualities of the two drugs were similar, amiodarone had a more favorable effect on left ventricular diastolic function and LA size. VAC parameters changed comparably in A and S groups during the course of treatment.
LV mass and galecetin-3 (LGAL3) as a marker of fibrosis in patients with AF and restored sinus rhythm and to evaluate the impact of LVM on the recurrence of AF.

Design and method: Overall, 28 patients with AF after sinus rhythm restoration were included in an open-label randomized clinical trial of one-year treatment with spironolactone and were analyzed in accordance to the LVM, estimated by LVM index. LGAL3 was assessed by ELISA method at baseline and after 12 months.

Results: The mean LVMi was 106.87 ± 21.21 g/m² (74–164, median 102.50 g/m²), in females = 111.14 ± 22.34; in males = 103.12 ± 20.14, p = 0.31. Patients with LGM3 above the median > = 13.75 pg/ml at baseline visit have higher LV mass – 107.00 ± 14.16 than the patients with LGAL3 below the median < 13.755 pg/m², mean difference 6.36 pg/m², 95% CI = -6.33–19.04, p = 0.11. LGAL3 increases with 1.22 ± 3.66 pg/ml within 1 year in patients with LV mass > = 102 g/m² above the median > = 1 episode of AF recurrence during follow-up.

Conclusions: There is a trend to higher LGAL3 according to LV mass. LGAL3 increases in patients with higher LV mass within 1 year. Patients with higher LVM tend to have more episodes of AF recurrence.

Conclusions: The development of left ventricular hypertrophy (LVH), defined as an increase in the mass of the left ventricle (LVM), is estimated to be 2055 (621/100,000). The estimated yearly

ASSOCIATION OF LEFT VENTRICULAR MASS WITH CARDIAC FIBROSIS AND ATRIAL FIBRILLATION RECURRENTNESS

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Objective: Development and progression of atrial fibrosis is the hallmark of structural remodeling in atrial fibrillation (AF). The data on the association of AF with ventricular fibrosis are controversial. Myocardial fibrosis is a key component in the development of left ventricular hypertrophy (LVH), defined as an increase in the mass of the left ventricle (LVM). The aim is to assess the relationship between
number of patients of African ethnicity in the Netherlands using any ATC C02D
antidepressive drug was very low at 85 per year (Figure). Thus less than 5% of pa-
tients from African ancestry with heart failure could have received the combina-
tion of isosorbide dinitrate and hydralazine.

Conclusions: Although the combined use of isosorbide dinitrate and hydra-
lazine is recommended by Dutch guidelines for heart failure in African ancestry patients,
we found evidence that prescription volumes are very low. Most patients do not
receive this cheap and highly effective combination therapy, shown to reduce mor-
tality in heart failure. We will transmit these findings to the relevant professional
organisations.

PP.14.22
J CURVE PHENOMENON. AN ANALYSIS OF BLOOD PRESSURE AND CARDIOVASCULAR EVENTS IN HYPERTENSIVE PATIENTS WITH CORONARY ARTERY DISEASE AND IMPAIRED SYSTOLIC FUNCTION

Objective: Low blood pressure is associated with worse outcome in hypertensive patients with coronary heart disease. A J curve phenomenon has been reported between blood pressure and cardiovascular events in those patients.

The purpose of the study was to determine the relationship between on-treatment BP and cardiovascular outcomes (death or heart transplantation) in hypertensive patients with CAD and impaired left ventricle systolic function.

Design and method: We prospectively followed-up 77 hypertensive patients with coronary heart disease and impaired left ventricular function for 28.1 ± 9.9 months. During this period, 15 patients died and 2 underwent heart transplantation. Blood samples for NT-proBNP assessment were taken at baseline and before cardiopul-
monary exercise to estimate peak oxygen consumption (VO2). LV cavity diameter, left atrial size and LV ejection fraction were measured by echocardiography.

Results: Patients with systolic BP levels < 117 mmHg presented increased NT proBNP plasma levels (2280 ± 2075 vs 947 ± 877, p = 0.001) at baseline in con-
front to patients with BP > 117 mmHg, worse peak VO2 levels (13.8 ± 3.9 vs 18.2 ± 4.6, p < 0.0001) and increased VE/VCO2 slope (41.2 ± 9.1 vs 35.5 ± 7.3, p < 0.01) respectively. In addition, patients with systolic BP > 117 mmHg, were on worse NYHA class (2.4 ± 0.6 vs 1.9 ± 0.8, p < 0.05) and presented decreased inotropic and chronotropic response to exercise (peak SBP at exercise 134.8 ± 27.6 vs 170.4 ± 24.5 mmHg, p < 0.001) and (peak HR at exercise 123.4 ± 17 bpm vs 137 ± 24 bpm, p < 0.05) respectively. Finally, patients with systolic BP < 117 mmHg presented 3 fold increase odds ratio for death or heart transplantation (p < 0.05).

Conclusions: Systolic blood pressure levels < 117 are associated with worse clin-
ical condition and worse outcome. More studies with larger sample are needed in order to verify a J curve phenomenon between blood pressure and cardiovascular events in hypertensive patients, with CAD and impaired systolic function.

PP.14.24
DIAGNOSTIC ACCURACY OF NEW ALGORITHM TO DETECT ATRIAL FIBRILLATION
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Objective: Several reports about the detection of paroxysmal atrial fibrillation (AF) by home blood pressure (BP) monitors have been published. The sensitivity values were near or equal to 100%, but the specificity values were 80–90%, and the diagnostic accuracy when the cut-off IPP values were set at 20% (IPP20) and 15% (IPP15). One sinus rhythm case was judged as IHB by the IPP15 setting. The diagnostic accuracy of the monitor AF was as follows: specificity was 1.0 in IPP25, IPP20 and IPP15, and the sensitivity was 0.88 in IPP25, 20% in IPP20 and 0.94 in IPP20; the specificity was 0.95–1.00 and the sensitivity was 1.0 in IPP15. One sinus rhythm case was judged as IHB by the IPP15 setting.

Conclusions: The new algorithm for a home BP monitor had high diagnostic ac-
curacy to detect AF, and had a low false-positive rate in IPP 20.

PP.14.25
C-344T POLYMORPHISM GENE ALDOSTERONE SYNTHASE (CYP11B), SERUM ALDOSTERONE AND ASSOCIATION WITH ATRIAL FIBRILLATION IN METABOLIC SYNDROME PATIENTS
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Objective: Aldosterone synthesis - enzyme involved in aldosterone synthesis. Metabolic syndrome (MetS) and hyperaldosteronism are risk factors for atrial fibrill-
lation (AF). The objective of this study was to investigate the association of the promoter polymorphism C(-344)T in the aldosterone synthase gene (CYP11B2) and serum aldosterone with the risk of AF in metabolic syndrome population, we carried out a case-control study.

Design and method: We carried out a case-control study of 290 subjects (163 pa-
tients with MetS: 75 with paroxysmal and permanent AF, 88 without AF and 127 controls), 110 males, 180 females, age 50,1 ± 10,2 years. The C(-344)T genotypes in the aldosterone synthase gene (CYP11B2) were determined by polymerase chain reaction-restriction fragment length polymorphism. Serum aldosterone concentration was determined by enzyme immunoassay.

Results: Prevalence of T(-344)T genotype of CYP11B2 in metabolic patients was higher than in control group (p = 0.04). Serum aldosterone concentration in MetS patients with AF and without this arrhythmia was higher than in healthy control (205.4 [130.0,293.8], 167.5 [90,8,303,2] and 117,0 [50,8,237,7] pg/ml, p = 0.0001 and p = 0.04). Serum aldosterone levels in carriers of different geno-
types C(-344)T CYP11B2 gene in metabolic syndrome patients with atrial fibril-
lation and without arrhythmia, in control groups did not differ (p=0.05).

Conclusions: Metabolic syndrome with and without atrial fibrillation is charac-
terized by high serum aldosterone level. Our results do not support the association of the aldosterone synthase C(-344)T functional gene variant and atrial fibrillation in metabolic syndrome patients.

PP.14.26
RELATIONSHIP OF THE NUMBER OF LESION AND NET ADVERSE CLINICAL EVENTS DURING THE ONE YEAR FOLLOW-UP PERIOD AMONG CORONARY ARTERY DISEASE PATIENTS WITH ANTIPLATELET THERAPY
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Objective: To explore the relationship between the number of lesion and net adverse clinical events (NACE) for coronary artery disease patients with antithrombotic therapy during the one year follow-up period in China.

Design and method: A definitive diagnosis of patients with coronary heart disease and receive antithrombotic therapy who came from 107 tertiary hospitals among 31 provinces and autonomous regions between November 2012 and December 2014 in China. All the patients were prospectively analyzed the relationship between the number of lesions and NACE for coronary artery disease patients with antithrombotic therapy during the one year follow-up period. Multivariate logistic regression analysis was used was used to analyze the risk factors of NACE.

Results: A total of 12118 patients were were analyzed, the cumulative incidence of NACE were 541 (12.7%), 551 (14.8%) and 754 (18.2%) among one lesion, two lesions and multivessel lesions, respectively (P < 0.05). Multivariate logistic regression analysis showed that multivessel lesions were independent risk factors for NACE (OR = 1.17, 95% CI: 1.01, 1.24; P = 0.001).

Conclusions: The more multivessel lesions, coronary heart disease (CHD) patients with antithrombotic therapy have a higher incidence of NACE during the one year follow-up period.

PP.14.27 COMPARATIVE ANALYSIS OF MIRNA EXPRESSION IN SERUM AND PLASMA OF PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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Objective: miRNAs are present in human biofluids and have been pointed as potential biomarkers for diagnosis and assessment of prognosis of different cardiovasucular diseases. Nevertheless, previous reports have suggested that different methodological variances could affect miRNA concentration. In this study we aim to compare the expression of major miRNAs associated with acute myocardial infarction (AMI) in plasma and serum from NSTEMI patients relative to samples from healthy volunteers.

Design and method: Plasma and corresponding serum samples were collected from healthy individuals (n = 20) and NSTEMI patients (n = 40) prior to coronary artery disease patients with antithrombotic therapy during the one year follow-up period. Multivariate logistic regression analysis was used was used to analyze the risk factors of NACE.

Results: miRNA yield was similar in samples from plasma and serum. The expression level of miRNA was similar in samples from plasma and serum. Nevertheless, we observed a higher variability of RNA in plasma than in serum, and we chose miRNA-484 as endogenous control. miRNA-26 decreased in samples from AMI patients showing the same pattern expression in serum and plasma (36 ± 5% and 18 ± 6% of control values, respectively, p < 0.01). miRNA-133a increased in serum (482 ± 78%, p < 0.01) and showed a slight increase in plasma (157% of control values, p < 0.05) from AMI patients. miRNA-92a expression was decreased only in plasma samples (33 ± 4%, p < 0.01), and miR-21 showed an opposite pattern expression, being 10-fold increased in serum (p < 0.05) and decreased in plasma (32 ± 9%, p < 0.05).

Conclusions: Plasma and serum exhibit different pattern of circulating miRNA expression in patients with AMI and suggest that results from studies with different starting material could not be comparable. These results call our attention to the importance of maintaining methodological care in when determining the expression of miRNA in patients.

PP.14.28 THE STATUS OF CEREBRAL ARTERIES, BLOOD PRESSURE, LEPTIN LEVELS AND POSTPRANDIAL HYPERTRIGLYCERIDEMIA IN PATIENTS WITH CORONARY HEART DISEASE COMBINED WITH HEPATIC STEATOSIS

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Objective: To explore the frequency of atherosclerosis of cerebral arteries, blood pressure, leptin levels and postprandial hypertriglyceridemia (PPG) in patients with coronary heart disease (CHD) in combination hepatic steatosis depending on the body mass index.

Design and method: Materials and methods. The study involved 24 men (group A) with coronary artery disease combined with hepatic steatosis, the control group consisted of 14 patients with coronary artery disease without hepatic steatosis. The study group was divided into 3 subgroups according to BMI (subgroup 1 - patients who are overweight, 2 - obesity degree 1, 3 - obesity degree 2). Evaluated atherosclerotic changes of the neck vessels, endothelial function, PPG, leptin levels, blood pressure.

Results: Results of the study. In the group A point plaques found significantly more often (31%, p = 0.01) when significantly more abuse on the part of endothelial function (47% lower, p = 0.01), than in group B. In patients with grade 2 obesity identified the highest leptin levels (43.6 ± 20.2, p < 0.05), which is 44% higher than in the subgroup with obesity 1 degree (24.4 ± 14.6, p < 0.05) and 63% greater than in the subgroup with overweight. The greatest increase in triglycerides after fat loading test with fixed subgroup 1 (70%) and in the control group (125%). The level mean systolic BP in a group A was higher (145.2 ± 5.8 mm Hg) than in group B (129.3 ± 4.4) (p < 0.05).

Conclusions: In patients with coronary artery disease combined with hepatic steatosis and PPG have different levels change depending on body weight. Increasing body weight was not associated with further development of atherosclerotic changes in the cerebral arteries. The level of systolic BP in a subgroup 1 associated with level PPG (r = 0.49; p < 0.05), body mass index (r = 0.49; p < 0.05), level of diastolic BP (r = 0.78; p < 0.05) than in subgroup 2 and 3.

PP.14.29 ALERT REACTION DURING VASCULAR NON-INVASIVE EVALUATION: WHAT ARE WE MEASURING?

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Objective: To determine associations between office and alert-BP component during vascular non-invasive evaluation, according to age groups. b-To evaluate hemodynamic mechanisms associated with alert-BP. C-To determine prevalence of alert-BP significantly elevated in each group.

Design and method: 168 patients were prospectively evaluated. After applying exclusion criteria (age below 18/above 80 years, secondary hypertension, heart diseases), 158 treated-hypertensives were included. Supine BP was measured (three determinations during five minute rest) prior to non-invasive vascular evaluation, that included: 1–Impedance Carotography, with evaluation of cardiac index (CI), vascular resistance index (VRI), and thoracic fluid content (TFC); and 2-Tonometric PWV. Finally, 24 hours ABPM was placed. Alert-BP was defined as the difference between office systolic-BP and diurnal systolic-BP in ABPM (a-ABPM). The population was sub-classified according to age in two groups: below (50 A) and above 50 years (B). Associations between office-SBP and a-ABPM were done. Univariate correlations between a-SBP and CI, VRI, TFC and PWV were performed (Pearson). High a-SBP (above 1SD of a-SBP mean value) was defined as the difference between office systolic-BP and diurnal systolic-BP in ABPM (a-ABPM). The population was sub-classified according to age in two groups: below (50 A) and above 50 years (B). Associations between office-SBP and a-ABPM were done.
females). Direct associations between office-SBP and a-SBP were found (A: r = 0.61, p = 0.0001 and B: r = 0.69, p = 0.0001). In A only CI was correlated with a-SBP (r = 0.31, p = 0.028). In B-group, both CI and PWV were directly correlated with a-SBP (r = 0.23, p = 0.01 and r = 0.23, p = 0.019, respectively). VRI and TFC were not associated with a-SBP in both groups. High a-SBP resulted in >26 mm Hg. The prevalence of High a-SBP was higher in B group (23.1% vs 6.38% in A, p = 0.016).

Conclusions: Alert-SBP component had a strong association with office-SBP, being ostensibly in maturity and old age. In young people was directly related to cardiac output, while those over 50 years showed linear relationships with cardiac output and arterial stiffness. Therefore, the hemodynamic evaluation in adults with elevated office-SBP may be partially affected by dynamic factors, with overestimation of some physiological parameters dependent of BP, as pulse wave velocity.

STATINS IN SECONDARY PREVENTION OF ATRIAL FIBRILLATION IN HYPERTENSIVE PATIENTS

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Objective: To study the effect of atorvastatin on the progression of arrhythmia in hypertensive patients with paroxysmal atrial fibrillation (AF) in the long-term prospective follow-up

Design and method: Patients with paroxymal AF (n = 65) were included into the study. The patients were divided into two groups depending on the lipid profile: group I (n = 33) received atorvastatin (10-40 mg/day), and group II (n = 32; control) did not take statins. The duration of follow-up was 4 years. The clinical evolution of AF course was assessed by the number of arrhythmia episodes for 3 months. Increasing prevalence of AF paroxysms AF over the past 3 months or development of permanent AF were considered arrhythmia progression.

Results: Increase in rate and duration of AF episodes was found in 14 (42%) patients of group I and in 13 (41%) patients of group II. Prevalence of AF progression was equal in groups I and II. The average arrhythmia progression was 10.5% per year in patients of group I and 10.3% in group II. No significant difference in the progression of AF between groups was found (p = 0.2).

Conclusions: Atorvastatin in hypertensive patients with paroxysmal AF did not change the rate and duration of arrhythmia. The average progression of paroxysmal AF into sustained type on follow-up was not associated with atorvastatin.

RISK FACTORS AND PROGNOSIS OF CONTRAST-INDUCED ACUTE KIDNEY INJURY IN PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION

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Objective: Contrast-induced acute kidney injury (CI-AKI) is a serious potentially preventable complication of percutaneous coronary interventions (PCI). It remains a challenge as use of PCI is growing, patient population is aging, diabetes and chronic kidney disease are coming more common. The risk factors and prognosis of CI-AKI are not well defined. The aim of the study was to evaluate the risk factors and prognosis of CI-AKI in patients undergoing PCI.

Design and method: 502 patients (346 male, 64 ± 12 years (M ± SD), arterial hypertension 92%, previous myocardial infarction 38%, diabetes mellitus (DM) 22%, known chronic kidney disease 19%, anemia 16%, heart failure 62%, left ventricular ejection fraction 40 ± 16%) who underwent PCI (stable angina pectoris (SAP), n = 50; unstable AP/non-ST-segment elevation myocardial infarction (UAP/NSTEMI), n = 236; STEMI, n = 216) were examined. CI-AKI was defined using 2012 KDIGO Guidelines. Mann-Whitney test and multivariate logistic regression analysis were performed. P < 0.05 was considered statistically significant.

Results: 18 % of total population, in SAP patients 12%; UAP/NSTEMI, 15%; STEMI, 20%, developed CI-AKI (p < 0.01). Patients with versus without CI-AKI in total population were older (68 ± 13 vs 63 ± 12 years, p < 0.05), had higher baseline SCR (114 ± 31 vs 92 ± 23 mmol/l, p < 0.05), white blood cells (WBC) (11.08 ± 2.41 vs 9.62 ± 3.86, p < 0.05), higher rate of DM (25 vs 15%, p < 0.05), anemia (30 vs 15%, p < 0.05) and higher rate of main left coronary artery disease (29 vs 15%, p < 0.01), higher contrast media volume/estimated glomerular filtration rate ratio (CV/eGFR) (4.32 ± 2.35 vs 2.47 ± 1.02, p < 0.05). Main independent predictors of CI-AKI were anemia (OR 2.42; 95% CI 1.43–4.09; p < 0.01), main left coronary artery disease (OR 2.29; 95% CI 1.35–3.89; p < 0.001), DM (OR 1.82; 95% CI 1.05–3.17; p < 0.05). Patients with CI-AKI had higher risk of 30-days mortality (11 vs 4%, p < 0.05) and similar rate of 6 months rehospitalizations (63 vs 48%, p < 0.05).

Conclusions: CI-AKI was associated with higher rate of comorbidities (DM, anemia), higher baseline serum creatinine and WBC, main left coronary artery disease. CI-AKI had negative impact on 30-days mortality and 6 months rehospitalizations.

ELECTROCARDIOLOGIC P AND QRS PARAMETERS AS THE RISK SIGNS FOR FUTURE ATRIAL FIBRILLATION IN HYPERTENSIVE PATIENTS

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Objective: The simple mode of identifying HT patients at risk for atrial fibrillation (AF) is important in practical clinical health care. Some non-invasive ECG and VCG parameters (in P and QRS waves and loops) are routinely available for ECG examinations. Especially, P wave/P loop values reflect the abnormal electrophysiological status in atrial myocardium.

Design and method: We studied 224 HT patients in sinus rhythm (SR): group I (n = 106, without documented AF), group II (n = 107, with well-documented paroxysmal AF), group III (n = 11, HT patients after successful radiofrequency ablation of AF).

ECG parameters were evaluated: (1) heart rate in SR (HR), ECG P wave and QRS, duration, non-filtered and after Hi-Res filtering: nPd, nQRSd, fPd, fQRSd, (2) VCG parameters of P, QRS axes, (3) angle between VCG loop axes P-QRS and VCG-T; (4) EchoCG parameters: LA dimension, LVEF, IVSd, PWD.

Results: [1] In group I and II the non-filtered parameters (nPd, fPd) and filtered parameters (fPd, fQRSd) were significantly longer than in group I (fPd: 135.0 ms, 145.0 ms vs. 129.0 ms,p < 0.05; for nQRSd: 105.0 ms, 113.0 ms vs. 99.0 ms, p < 0.01; for fQRSd: 119.0 ms, 125.0 ms vs. 115.0 ms, p < 0.05). [2] P loop axis is significantly higher in group II and III vs. group I (+50.0 gr., +55.0 gr. vs. +47.0 gr.; p < 0.01). [3] Angle P-QRS is significantly higher in group II and III vs. group I (46.5 gr., 42.0 gr. vs. 24.3 gr.; p < 0.005). [4] EchoCG parameters were not significantly different. (LA dimensions for groups I, II, III: 40.0 mm, 42.7 mm, 42.0 mm, ns.).

Conclusions: HT patients with verified pFA in documentation have more abnormal P and QRS wave/loop parameters than HT patients without history of pFA. The most informative ECG parameters for possible future pFA are: fQRSd and angle between loop axes P-QRS, ECG and VCG parameters (non-filtered and especially after High-Res analysis) have the potential to improve the risk stratification for possible pFA or pFLA. These cross-sectional results is necessary to confirm with futher follow-up (after 12 months later).

REMODELING OF THE HEART IN PATIENTS WITH RHEUMATOID ARTHRITIS AND PREHYPERTENSION

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Objective: In the recent years often discussed the involvement of the cardiovascular system and increased cardiovascular risk in patients with rheumatoid arthritis (RA). In addition, arterial hypertension may be accompanied by electrophysiological changes and violation of the geometry of the heart. Aim: the study of early pre-clinical parameters of myocardial electrical instability and lesions of the anatomical structures of the heart in patients with RA and prehypertension and their relationship to activity, duration of the disease.

Design and method: Study of 94 patients with reliable RA and prehypertension. Disease duration was <3 years - 19.1%, >3 years – 80.9%. According to DAS in patients with low activity was 11.7%, moderate in 14.9%, high - 73.4%. To assess the geometry of the heart were used echo the recommendations of the ASE and EAE (2005/2006). In vectorcardiography (VCG) has produced the calculation of the area of QRS loop and T loop.
Results: 13.8% patients with as were found changes in the geometry of the heart: concentric remodeling – in 2.12%, eccentric hypertrophy - in 11.7% patients. The area of the QRS loop in patients with disease duration < 3 years was 1084.13 ± 132.42 mV, and in the group with disease duration >3 years the average loop area of the QRS – 2840.56 ± 224.41 mV (p < 0.05). The area of a loop T in the group with duration < 3 years – 675.48 ± 85.52 MB, and in the group >3 years – 704.02 ± of 29.44 MB. The area of the QRS loop in the group with low activity amounted to 895.13 ± 37.19 MB, with moderate – 1084.13 ± 132.42 mV and with high – 3017.73 ± 235.86 mV (p < 0.001). The area of a loop T in the group with low activity amounted to 190.53 ± 82.44 MB, with moderate – 675.48 ± 85.52 MB, and with high – 713.35 ± 32.14 MB (p < 0.001).

Conclusions: Disease duration >3 years and increased activity in patients with RA and prehypertension was accompanied by increased electrical activity of the ventricles and extension of the process of repolarization. Thus, the duration and activity as are the factors leading to remodeling of the heart in patients with RA and prehypertension.

Objective: Evaluation of left ventricular hypertrophy and dyastolic dysfunction as risk factors of sudden death (SCD) among patients with myocardial infarction (MI)

Design and method: 300 pts. with MI was divided on two groups: 1 – pts. with increasing of ventricular mass index (LVMI) 208 pats., 2 – pts. with normal LVMI 92 pats. The used method were ECHO CG, arterial baroreflex sensitivity (ABS) and blood test, IL 1, beta, 6, TNF-alfa, CD 95 of lymphocytes.

Results: The SCD rate at restrictive type of dyastolic dysfunction (DD) was (p = 0.002) higher (16.7%) compared with nonrestrictive DD (5.0%) and at patients without DD (7.5%). Ventricular arrhythmias at patients with the DD restrictive type met (p = 0.004) more often (in 63%), versus non restrictive DD (35.4%) and without DD (29.1%). An ABS on 1-st day of MI was decreased; correlations between BS and DD (r = -0.4, p < 0.05), BS and left atrium size (r = -0.4, p < 0.05). At DD only authentic increasing level of CD95 of lymphocytes, (0.44 ± 0.3*10^9/l against 0.34 ± 0.2*10^9/l, p = 0.01) was noted. The analysis of death has shown that in 1 group during the 1 year after MI 32 pts. have died, from them SCD - 26 (12.5%), not suddenly - 6 pts. (2.9%). In 2 group the death was observed at 5 pts: SCD 4 (4.3%) and not SCD at 1 (1.1 %). The Cox analysis for SCD, at one-factorial model from 194 variables allocated LVH as a significant sign for SCD: relative risk - 2.2; 95 % confidential intervals: 1.09 - 8.3; beta - 1.6; p = 0.02.

Conclusions: DD increased SCD risk at the account of interrelationship with such predictors as VA, lowering of sensitivity of cardiochronotropic component of ABS.
PP.15.01 ESTIMATION OF 24-H URINE SODIUM FROM SPOT URINE: A TENDENCY OF MOVING ESTIMATED MEAN TOWARD TO MEAN OF POPULATION FROM WHICH REGRESSION MODEL WAS ESTABLISHED

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Objective: Most equations estimating 24-h urine sodium (e24HUNa) from single spot urine have been developed by using regression model of sample population. Those equations have been challenged its tendency of under- and over estimation of e24HUNa depending on the amount of sodium intake. We hypothesized that the mean of e24HUNa from single spot urine depends on the mean of measured 24-h urine sodium (m24HUNa) of population from which regression model was established.

Design and method: A population (n = 791) was divided into (1) sepioles and (2) quintiles with the level of m24HUNa. In each sepiole, e24HUNa was calculated by using previously suggested equations (Kawasaki, Tanaka, and Danish equations), and compared to m24HUNa. In each quintile, e24HUNa was calculated by estimating equations developed from remainders of population by using regression model, and compared to m24HUNa.

Results: Mean e24HUNa calculated by tested equations was higher than m24HUNa in sepioles with lower m24HUNa compared to higher m24HUNa, showing a tendency of moving e24HUNa toward to the mean of development population, from which regression equations were developed. Regression equations, developed from population excluding each quintile, showed overestimation in quintiles of low m24HUNa and overestimation in quintiles of high m24HUNa.

Conclusions: Estimation of mean sodium intake at population level from single spot urine by using regression equations showed a tendency of moving the calculated mean toward to the mean of population, from which regression model was established. This phenomenon suggests that estimation of sodium intake at the population by using single spot urine should be reappraised.

PP.15.03 MEASURE ACCURATELY, ACT RAPIDLY AND PARTNER WITH PATIENTS (MAP) IMPROVES HYPERTENSION CONTROL: PILOT-STUDY RESULTS FROM CARE COORDINATION INSTITUTE / AMERICAN MEDICAL ASSOCIATION

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Objective: A quality improvement program to improve hypertension control with evidenced-based interventions for Measuring blood pressure (BP; mmHg) accurately, Acting rapidly to manage uncontrolled BP, and Partnering with patients to promote self-management of BP (MAP) was implemented in 2016 in a Family Medicine residency in South Carolina, United States.

Design and method: Hypertensive patients were included in the study if they had a visit in the year before intervention (baseline period) and at least one visit during the six-month intervention period. Omron HEM-907 devices were used to measure BP with a checklist for positioning; if initial BP was > 140/90, the automated office BP (AOBP) device was used to measure three additional BPs one minute apart with the patient alone in the examination room (measure accurately) and display the AOBP mean. When AOBP mean was > 140/90, intensification of antihypertensive medications (act rapidly) took place and was assessed by the percent of visits with uncontrolled BP and no treatment change (therapeutic inertia). Facilitating BP self-monitoring and using affordable generic medications (partner with patients) was assessed indirectly by a reduction in systolic BP (SBP) per therapeutic change.

Results: 714 hypertensive adults met inclusion criteria (mean age 54.4 years, 53.8% black, 66.0% female, 50.3% Medicaid). From baseline to the last intervention visit, BP control increased from 61.2% to 88.0% (p < 0.01). Among 277 uncontrolled hypertensive patients at baseline, mean systolic/diastolic BP fell from 147/88 to 131/79 (p < 0.01) and 80.5% (223/277) were controlled to < 140/90. For measuring accurately, SBP was 12.7 mmHg (p < 0.001) lower among the uncontrolled group with improved technique; while AOBP measurement showed a 2.5 mmHg (p < 0.05) lower SBP. Therapeutic inertia was unchanged (44.4% vs. 38.3%; p = 0.57); the reduction in SBP per therapeutic change increased from 8.3 mmHg to 21.6 mmHg (p < 0.01).

Conclusions: MAP was associated with better hypertension control in a medically underserved population. Data indicate that measuring accurately and better patient engagement, i.e., greater decrease in SBP with each therapeutic change, accounted for improved hypertension control. Plans are in place to spread the program to 40 additional practices.
Design and method: The study counted on 16 participants, all normotensive postmenopausal women (55.3 ± 6.9 years, 27.7 ± 3.4 Kg/m²), who were submitted to four experimental sessions in random order and crossover design. These being, PILATES: ten floor exercises during 35 minutes, with a Rate of Perception of Exertion (RPE) between 11 and 14; AEROBIC: 35 minutes on the treadmill between 60 and 70% of heart rate reserve; RESISTANCE: resistance exercises at 60% of 1RM; CONTROL: no physical exercise. Blood pressure (BP) (Omoron – HEM-7200) and heart rate variability (HRV) (Polara® RS800CX) were evaluated at rest and during 60 minutes after the intervention. Samples of saliva were collected at rest and immediately, 30 and 60 minutes after exercise for analysis of nitrite concentration (NO2-) and total proteins (TP). The area under the curve (AUC) of BP was used to compare all sessions.

Results: Systolic, diastolic and mean BPs AUCs were lower (p < 0.05) in both aerobic and resistance exercises sessions but not Pilates session comparing with control session. NO2- concentrations in saliva were higher one hour after the end of all exercises sessions comparing with control session, which did not occur in the TP concentration. The HRV was higher after resistance session in relation to all other sessions.

Conclusions: These results indicate that acute Mat Pilates session was not capable of decreasing arterial blood pressure after training in postmenopausal women.

Objective: Verify the effects of isoflavone supplementation associated with combined exercise on ambulatory blood pressure responses in normotensive postmenopausal women.

Design and method: A randomized, double-blind, controlled clinical trial involving 32 healthy postmenopausal women, aged 54.4 ± 5.4 years, BMI of 26.6 ± 1.0 kg/m² and 5.6 ± 4.6 years after menopause randomly assigned to the group: placebo and exercise (PLA + EXE), n = 15) or 100 mg of isoflavone and exercise (ISO + EXE, n = 17). Before and after 10 weeks of combined moderate intensity aerobic + resistance exercise training, the blood pressure was evaluated through ambulatory blood pressure monitoring (ABPM) for 24 hours. Resting blood pressure (BP) and samples of saliva were also collected before and after exercise training period for analysis of nitrite concentration (NO2-). The analysis of Generalized Estimates (GEE) with multiple comparisons made with the Bonferroni correction was used to analyze the before and after intervention on blood pressure values every 2 hours. The BP variation over time was analyzed by the trapezoidal area under the curve (AUC), and these values, and salivary NO2- concentrations as well, were analyzed by the ANCOVA with the covariate adjusted by the pre-value in the SPSS software version 13. The level of significance adopted was p > 0.05.

Results: ANCOVA showed no difference in mean values and AUC of systolic, diastolic and mean BPs in the periods of awake, sleep and 24 hours total between groups. However, resting diastolic BP were significantly lower (9%) and salivary NO2- concentrations were significantly lower (14%) in the ISO + EXE group as compared to the PLA + EXE group (p < 0.05).

Conclusions: The supplementation of 100 mg / day of isoflavone soy does not potentiate the effects obtained by combined aerobic and resistance exercise training in the reduction of blood pressure in normotensive postmenopausal women.
Objective: Failing to reach blood pressure (BP) goals is a major problem in treatment of hypertension, causing a high socioeconomic burden, sequel morbidities and strongly increased mortality. Recent studies demonstrated that interventional decentralized telemonitoring (idTM®) can strongly improve BP management in hypertension including high risk patients. In the EDIMed-Project (efficiency analysis of services in telemedicine) - supported by German Ministry for education and research - the cost-benefit ratio was analyzed and a positive socioeconomic impact was found.

Design and method: This project aims at establishing a telemonitoring system that allows to extend this service to all European Excellence centers for hypertension treatment and ultimately to all physicians treating hypertensive patients in Europe. For this effort, the unique software SciTIM® providing highest standard of data security was developed for the register to allow:

- Making idTM® available to physicians and patients across Europe
- Establishing teledmedical standards for selected hypertensive indications (renal failure, pregnancy, juveniles)
- Establishing a system for collections of high quality epidemiologic data from daily medical practice, ultimately extend beyond planned register
- Establishing a digital interface for direct interaction between specialists and general practitioners based on patient data.

Results: The register nucleus started with 8 ESH-centers in 2017. To integrate data directly from the data management systems the project has and will generate interfaces to the most commonly used medical data management systems. In addition, the system provides an user interface to physicians, enabling to monitor their patient’s telemonitoring progress at the first time directly in their electronic health records enabling physicians to set individual patient limits and specific rules to pro-actively alert staff members via auto generated messages and daily reports.

Conclusions: The EUSTAR consortium has establish a register based on needs of medical specialists under the aegis of the ESH and will roll out this register throughout Europe. A database was created that allows safe and standardized exchange of data. The System includes interfaces for data collection from medical measurement devices and be open for all possible providers and also for other data than the first two parameters blood pressure and body weight.

PP.15.11 EVALUATION OF AFFECTIVE TEMPERAMENTS, DEPRESSION AND ANXIETY IN WHITE-COAT, WELL-TREATED AND RESISTANT HYPERTENSION AND IN HEALTHY CONTROLS

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Design and method: In our study, 261 patients were included: 148 Chr, 29 Res, 17 Wh and 67 Cont subjects. The patients completed the Temperament Evaluation of Memphis, Pisa, Paris, and San Diego Autoquestionnaire (TEMPS-A), the Beck Depression Inventory (BDI) and the Hamilton Anxiety Scale (HAMA). Blood pressure was measured with a validated oscillometric device (Omron M5) and arterial stiffness was examined with tonometry (PulsePen).

Results: Significant differences were found between the Cont, Chr, Res and Wh in brachial systolic blood pressure (121.44 ± 11.1, 131.66 ± 12.16, 151.1 ± 27.92, 136.31 ± 12.31 mmHg, respectively) and in pulse wave velocity (7.78 ± 1.39, 9.24 ± 2.19, 10.49 ± 2.76, 8.06 ± 1.61 m/s, resp.). In cyclothymic affective temperament scores we found significant differences between the Cont, Chr and Res groups (20(–4), 31(–5), 43(–8), resp.) with the highest score in Res. In BDI scores also significant differences were found between Cont, Chr and Res (3(0–5), 5(2–9), 7(4–12.5), resp.), while in HAMA scores differences between Cont, Chr, Res and Wh (3(1–6), 5(2–9), 12 (6–19.5), 5(8–10.5), resp.) groups were found. Res group showed the worst BDI and HAMA profiles as well.

Conclusions: Evaluation of affective temperaments might be helpful in identification of high-risk subgroups of hypertensive patients. However, prospective studies are required to confirm these observations.

PP.15.12 MEDICUS, A MOBILE-BASED, A PATIENT-CENTERED APPROACH TO THE TRACKING, PREDICTION, AND PREVENTION OF HYPERTENSION AND CARDIOVASCULAR CONDITIONS

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Objective: Lifestyle choices are critical contributors to the onset of hypertension and related cardiovascular diseases (1, 2). However, patients and health practitioners are often confronted with the challenge of understanding and drawing meaningful conclusions from a large number of analysis reports such as blood tests, NGS data, etc.

Design and method: Medicus is a healthcare platform that converts medical reports with their cryptic numbers and medical language into a visual experience with personalized easy-to-understand health insights and actionable recommendations. Medicus is powered by a Medical Reasoning Engine that uses AI to encode medical knowledge.

Results: One of our primary focuses at Medicus is hypertension and the heart health. We’re tracking biomarker changes in response to users’ profile (sex, age, ethnic origin), lifestyle habits (alcohol, smoking, diet type, activity, BMI), used medication, genetic predisposition or existing condition. To date, we cover and track vitals including blood pressure, heart rate (HR), temperature, along with other serum biomarkers such as hematological variables, lipids, glucose, renal, and liver markers. Such detailed data allows Medicus to give the user a customized hypertension and cardiovascular health risk assessment while tracking users’ progression over time and linking it to lifestyle changes among others (3). In addition to cardiac markers, new biomarkers will be added and analyzed via our algorithms, including blood pressure, and HR related variables such as resting, high resting, target, recovery HR, and HR variability in a variety of user profiles including healthy users, athletes, and hypertensive or cardiac patients.

By presenting our innovative platform to researchers and health practitioners, we aim to establish two-way research collaborations to improve our product and contribute to advancing the research, clinical and medical fields. Researchers can benefit from compliant patients data to support their studies and understand more the factors that affect hypertension and related cardiovascular conditions.

Conclusions: In conclusion, Medicus’s goal is to change the way people understand and interact with their health by promoting the predict and prevent model (3). This personalized approach will significantly reduce the onset of conditions by focusing on measurable risk factors and driving positive behavioral change.

PP.15.13 EFFECT OF RENAL DENERVATION ON BLOOD PRESSURE IN PATIENTS WITH RESISTANT HYPERTENSION AND TYPE 2 DIABETES MELLITUS AFTER A 2 YEARS FOLLOW-UP

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Objective: Combination of the type 2 diabetes mellitus (T2DM) and resistant hypertension (RHTN) associated with very high cardiovascular risk. Renal denervation (RDN) is a new non-pharmaceutical approach for treating RHTN. The aim of this study was to evaluate long-term blood pressure (BP) lowering after RDN in patients with RHTN and T2DM.
Design and method: Forty seven patients with true RHTN and T2DM (mean age 60.0 ± 8.8 years, mean office BP 169.7 ± 19.1mmHg, mean Hba1c 6.7 ± 1.4%, mean eGRF 76.4 ± 21.9 mL/min/1.73m², 18 male) were included in single-arm prospective interventional study (detailed protocol was published on ClinicalTrial.gov, number NCT01499810). Office BP measurement, ambulatory 24-hour BP, rennal Doppler ultrasound and assessment of renal function and plasma Hba1c levels were performed at baseline and follow up. On average, patients were taking 3–5 antihypertensive drugs at optimal dosages, including a diuretic. None of the patients changed the antihypertensive treatments during follow-up. Six months follow up was completed by 42 patients, 12 months – by 38 pts, 2 years- by 15 pts.

Results: There were significant reduction in office BP at 6, 12 and 24 months by -22.9/-10.7, -25.4/12.5 and -36.7/-21.1mmHg, respectively, p < 0.01. Mean 24h-SBP change at 6, 12 and 24 months after RDN was -10.9/-6.8mHg, -12.4/6.9mmHg and -12.8/7.4 mmHg, respectively, p < 0.01. The number of responders with a reduction in SBP >10 mmHg were 71%, 71% and 93% at 6, 12, and 24 months, respectively. A 24h-SBP drop >10 mmHg occurred in 59%, 63%, and 67% pts at 6, 12 and 24 months, respectively. The goal BP was achieved in 37%, 37% and 54% pts at 6–12–24 months, respectively. The number of pts with stage 3 hypertension was baseline in 11 pts (23%), after 6 months- in 4 pts (10%), after 12 months- in 2 pts (5%) and not at anybody after 2 years.

Conclusions: In patients with resistant hypertension and type 2 diabetes mellitus RDN was associated with significant and sustained long-term reduction BP without deterioration of renal function. Moreover, the frequency of achieving the goal BP after 2 years observed in almost half of patients.

PP.15.14 EFFECT OF GENDER AND AGE ON NUTRITION PATTERN IN SUBJECTS AGED 25-54 WITH HIGH NORMAL BLOOD PRESSURE

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Objective: to evaluate effect of gender and age on nutrition in subjects with high normal blood pressure aged 25–54.

Design and method: 589 male and 608 female from an organized working population with high blood pressure 130–139/85–89 mm Hg were examined using 24-hour recall method.

Results: Cholesterol consumption was higher in men; it was decreased with age in men, but increased in women. The similar trend was for dietary fat and carbohydrates consumption. Protein consumption was higher in men and it was decreasing with age (p < 0.05), while in women it was increasing with the advancing age. Consumption of sodium was higher in men, than in female, but it decreased with age, while it remained stable in women. A similar situation was true for potassium in men. Women with advancing age had nutrition with higher potassium (p < 0.05). Calcium consumption was not different between the sexes, it was higher with the advancing age only for women (p < 0.05). Consumption of magnesium was lower in men and with advancing age it was further decreasing, while in female with age it was increasing. Nutrition with less fiber consumption was observed in men; it was decreased with age in men and remained stable in women. Calorie intake was higher for men (p < 0.001) and decreased with age in both sexes (p < 0.05).

Conclusions: Age and gender in different ways on the impact on nutrition pattern. These effects should be taken into account for diet recommendations to prevent hypertension in subjects with high normal blood pressure.

PP.15.16 A NEW MODEL FOR OBTAINING THE RISK ASSESSMENT OF DEVELOPING HYPERTENSION BASED ON ARTIFICIAL NEURAL NETWORKS

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Objective: Implement a computational system using a novel model based on neural networks and fuzzy logic to assess the risk of developing hypertension in 4 years based on previous data of patients as an alternative to the Framingham Heart Study guidelines, in this way providing physician with a tool to help them in their treatment of patients.

Design and method: The artificial neural network (ANN) is trained with the risk factors of the patients, considering as the inputs: the systolic and diastolic blood pressures, age, sex, smoking, body mass index and if the patient has hypertensive parents. The ANN models the information, obtaining as output the percentage of the risk of developing hypertension in the next 4 years. Different tests are performed by varying the ANN architecture parameters, such as the number of layers, the number of neurons per layer, training algorithm, and epochs. The best results are obtained with 2 hidden layers, 10 and 14 neurons in each layer, 500 epochs and with the Levenberg-Marquart training algorithm.

Results: The results obtained with the ANN model and the traditional Framingham Heart Study are compared, and it can be observed that there is no significant difference between them, that is, the neural network is learning correctly, of the set of patients used for testing, and it is observed that in only one there was a variation between the methods of 1%.

Conclusions: This soft computing paradigm is powerful for these cases, as it demonstrates that it can be applied with a high level of confidence, since, as can be observed the variation between the results obtained by the formula given by the Framingham Heart Study and the artificial neural network is very low.

PP.15.17 GENETIC OPTIMIZATION OF THE FUZZY RULES IN A NEURO FUZZY HYBRID MODEL FOR BLOOD PRESSURE LEVEL CLASSIFICATION

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Objective: A neuro-fuzzy hybrid model (NFHM) as a new computational method to classify blood pressure (BP) is presented. The objective of the study is to model the behavior of blood pressure in 24 hours per patient and to obtain the trend, which is classified using a fuzzy system based on rules given by an expert, and these rules were optimized by a genetic algorithm to obtain the appropriate number of rules for the system.

Design and method: Intelligent computing techniques include neural networks, fuzzy logic and evolutionary computation. In this case, we use a neural network with a modular architecture to model the behavior of BP and obtain the trend. Also we use a fuzzy system in which we have as inputs the systolic and diastolic pressures, and the output is the BP level. The fuzzy system based on experts for the classification of BP gives as classification of BP level such as: Hypotension, Optimal, Normal, High Normal, Grade 1 hypertension, Grade 2 hyper tension, Grade 3 hypertension and isolated systolic hypertension Grade 1, Grade2 and Grade 3; Finally we use evolutionary computation, in this case we use genetic algorithm to reduce the number of rules based on an expert, which is based on combinations that are not necessary for the system.

Results: Of the 50 patients who were monitored, the classification in the first fuzzy system with 24 rules given by an expert, the result was: accuracy rate of 90% with a 10% error and in the second fuzzy system optimized with the new method reduced it was reduced to 21 rules giving as a result: 98% accuracy rate and 2% error.

Conclusions: Neuro fuzzy hybrid models actually implement the human reasoning, using a set of optimized decision rules based on an expert, we can give a diagnosis of BP level. This is a very efficient, less time consuming and more
accurate method to determine the risk of having bad BP. This is a effective method for diagnosis of bad BP, which can help a physician achieve better accuracy when giving a diagnosis to the patient.

**PP.15.18 FINDING SUPPLEMENTS TO TRADITIONAL BP MONITORING: A CORRELATION RESEARCH ANALYSIS FROM MODEL NCD LIFESTYLE CLINIC, JODHPUR, INDIA**

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**Objective:** To monitor relationship between hypertension and indicators/risk factors in patients at model NCD lifestyle clinic (MNLC) and suggest supplementary indicators based on findings.

**Design and method:** Present study was carried out at MNLC situated Urban Health Center (UHC) Pratap Nagar, Jodhpur. Secondary data i.e digital medical records of the patients (n = 1036) collected between Nov, 2015 to Nov, 2016 were analyzed using appropriate statistical tests (descriptive, pearson’s correlation analysis). Data included patient’s personal and clinical examination details, lifestyle, laboratory values, anthropometric measures etc. Confidentiality of the data was maintained and ethical approval obtained from Institutional ethical committee: AIIMS, Jodhpur.

**Results:** The mean age of patients was 58 ± 4.6 years and majority females (57.6%). Prevalent morbidities were: Hypertension (72.9%), Diabetes (23.7%) and Obesity (67.2%). The mean systolic (SBP) 152 ± 9.8 mmHg, diastolic blood pressure (DBP) 91 ± 5.7 mmHg, Fasting blood sugar 112 ± 7.4 gm/dl and total cholesterol (TC) 178 ± 12 gm/dl. Mean weight (BW) 76 ± 5.4 kg, body mass index (BMI) was 26.4 ± 4.7, mean waist circumference (WC) 97.5 ± 7.2 cm and waist-to-hip ratio (WHR) 0.97 ± 0.17 reflecting the high burden of central obesity. Correlation analysis demonstrated positive relationship between BP-Weight (r = 0.88) BP-FBS (r = 0.76), BP-WHR (r = 0.70). However, the BP-BMI (r = 0.16) and BP-TC (r = 0.28) showed a weak positive relationship.

**Conclusions:** Present research suggests BW, FBS and WHR demonstrate incremental risk trend towards rising BP, major pathology in hypertension. It is suggested that further research be conducted to devise research backed proxy indicators/risk factors as supplements to error prone tradition BP monitoring for improved clinical outcomes.

**PP.15.19 COST-EFFECTIVENESS OF ANGIOTENSIN RECEPTOR BLOCKERS IN PATIENTS WITH UNCOMPLICATED HYPERTENSION: A COMPARATIVE ANALYSIS USING CLINICAL AND DRUGS UTILIZATION DATA**

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**Objective:** Health benefits and related cost savings are achieved optimizing treatment of hypertension patients (HTs). The aim of this study was to evaluate the costs and cost-effectiveness of treatment with angiotensin II receptor blockers (ARBs) in HTs with uncomplicated essential hypertension and to compare the costs and percentage share of prescription associated with ARBs to reach blood pressure (BP) control.

**Design and method:** Costs of the ARBs was estimated based on pharmacy dispensing records and the BP-lowering effects of candesartan, losartan, olmesartan, telmisartan and valsartan was evaluated retrospectively. In details, 114 HTs (mean age 59.4 ± 13.5, 57.5% men) taking anti-hypertensive therapy with ARBs, and consecutively referred to our Hypertension Centre from November 2105 to November 2016 has been evaluated. The BP-lowering effect of ARBs as in monotherapy than combined with hydrochlorothiazide at the doses commonly used in the market to reach BP control (i.e. BP < 140/90 mmHg) was analyzed. Office BP was evaluated at baseline and after an average of 6-month follow-up consulting the medical fields. Analysis of variance for repeated measures was provided.

**Results:** At baseline office BP was not different between ARBs. Treatment with candesartan (7.9% of HTs) and olmesartan (34.5% of HTs) versus other ARBs resulted in a significantly decrease of systolic BP (SBP) and diastolic BP (DBP) when systolic BP is uncontrolled with olmesartan. However, for definite conclusions to be drawn, this hypothesis-generating study requires confirmation from further prospective studies comparing ARBs based on their effect on BP control and hard endpoints.

**Conclusions:** Candesartan was estimated to be the most favorable option in terms of cost-effectiveness. These data have some limitations, but open the question if candesartan treatment should be preferred to olmesartan in this clinical setting, and even in to switch anti-hypertensive treatment to candesartan when systolic BP is uncontrolled with olmesartan. However, for definite conclusions to be drawn, this hypothesis-generating study requires confirmation from further prospective studies comparing ARBs based on their effect on BP control and hard endpoints.

**PP.15.20 COST-EFFECTIVENESS OF RENAL DENERVATION COMPARED TO ANTIHYPTERTENSIVE DRUG THERAPY IN TRUE RESISTANT HYPERTENSION: WE THINK IT OVER!**

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**Objective:** Although the failure of the SYMPLICITY-3 trial in reaching its primary efficacy end-point, the catheter-based renal sympathetic denervation (RDN) remains the only tool to improve blood pressure (BP) control in patient with true resistant hypertension (RH). In the Veneto region, RDN is authorized only in two specialized centers, but in selected cases, is also performed in hospitals organized in the so-called Hub-model. Patients with RH are at a high risk for developing serious cardiovascular events increasing the global health costs. In this study, we assess cost-effectiveness and short-term clinical benefits of RDN.
Design and method: A 48-years old male, with a history of hypertension dated for over 10 years was annually admitted to our department for high BP levels not controlled by therapy until 7 anti-hypertensive drugs. The search for a cause of secondary hypertension revealed no clues. He was diabetic, overweight, with stage-3 of chronic renal disease and had multiple organ damage. At the last admission, BP averaged 226/128 mmHg and his medications were: amlopidine 20 mg, Ramipril 10 mg, spironolactone 50 mg, doxazosine 8 mg daily. 24h-ambulatory BP measurement (Figure 1A) confirmed RH. Patient underwent to RDN procedure using a third generation SpyralTM catheter, a device that is associated with a reduced procedure time, contrast use and radiation exposure. RDN was performed without complications, and after 48 h BP lowered up to 50 mmHg with 3 antihypertensive drugs (Figure 1B). Medical records of the 10 years before the last hospitalization were collected, and on medical DRG the global costs for RH management has been calculated and compared with the cost of the RDN procedure.

Results: RDN therapy resulted in an increase on health benefit both for BP control and pharmacological treatment, so that patient stopped taking 4 anti-hypertensive drugs. In 10 years of admissions, the global health costs of hypertension management reached more than 57,000 Euro compared to the about 6,000 Euro of the RDN procedure.

Conclusions: RDN offers a meaningful and cost-effective alternative for achieving BP control, where traditional combination of antihypertensive pharmacologic strategies, have been proven to be ineffective.

**PP.15.22 EPINEPHRINE IS REQUIRED FOR PREVENTING BLOOD PRESSURE OVERSHOOT AND THUS CARDIAC HYPERTROPHY IN CHRONIC EXERCISE**

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Objective: Phenylethanolamine-N-methyltransferase-knockout (Pnmt-KO) mice are epinephrine-deficient and appear to have concentric heart remodelling. Although Pnmt-KO mice resting blood pressure is normal, it becomes higher than wild type mice during acute treadmill exercise. However, the role of epinephrine in cardiovascular response to chronic exercise remains unclear. Therefore, the aim of this study was to evaluate heart morphological, functional and molecular alterations after chronic exercise in epinephrine-deficient mice.

Design and method: PCR-based genotyping was performed at the Pnmt locus of Pnmt-KO (Pnmt−/−) and wild-type (WT) mice (Pnmt+/+). Wild-type mice were selected to serve as the control group. Pnmt-KO mice were divided into two groups, the control group underwent to 4-weeks of treadmill exercise at a running speed of 20 m/min, 55 minutes, 5 days per week. Blood pressure was measured by a photoelectric pulse detector after treadmill exercise, at rest. Mice were anaesthetized and heart morphology and function were evaluated by echocardiography and hemodynamics. Molecular markers of cardiac hypertrophy were evaluated by real-time PCR.

Results: Systolic blood pressure was significantly increased in Pnmt-KO when compared to WT mice. A significant increase was found in left ventricular posterior wall thickness and mass in trained Pnmt-KO compared to trained WT mice, without significant differences in LV volume. Compared to basal parameters, acute β1-adrenergic stimulation with dobutamine increased cardiac index in trained WT mice, contrary to trained Pnmt-KO mice. In the left ventricle, mRNA expression of ANP and IGF-1 were significantly increased in trained Pnmt-KO mice when compared to trained WT mice.

Conclusions: In conclusion, increased blood pressure overshoot in response to exercise appears to be associated with an increase in left ventricular posterior wall thickness and mass in chronic exercise, suggesting a concentric hypertrophy of the left ventricle in trained Pnmt-KO mice. In addition, acute hemodynamic stress induced by dobutamine increased systolic function index in trained WT, contrary to trained Pnmt-KO mice, suggesting a possible initial stage of pathological cardiac hypertrophy in these mice. Therefore, epinephrine appears to be essential for prevention of blood pressure overshoot and thus cardiac hypertrophy in chronic exercise.

**PP.15.23 CLINICAL CHARACTERISTICS, OFFICE BLOOD PRESSURE, MEDICAL THERAPY AND CARDIAC STRUCTURE IN SUBJECTS WITH SUSPECTED DRUG-RESISTANT HYPERTENSION REFERRED TO HYPERTENSION CLINIC**

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Objective: Drug-resistant hypertension is a common condition that refers to cases of resistant hypertension after medical treatment. The aim of the study was to determine the characteristics of patients with drug-resistant hypertension in our center.

Methods: A retrospective analysis of medical records of patients referred to our center for drug-resistant hypertension was performed. The study group consisted of 100 patients, of whom 62 were men and 38 were women. The mean age of the patients was 58.7 ± 11.9 years. The diagnosis of drug-resistant hypertension was based on the presence of hypertension after treatment with at least 3 antihypertensive drugs. The main results of the study are presented in the article.

Results: The main results of the study are presented in the article. The analysis of the results showed that drug-resistant hypertension is a common condition that refers to cases of resistant hypertension after medical treatment. The study group consisted of 100 patients, of whom 62 were men and 38 were women. The mean age of the patients was 58.7 ± 11.9 years. The diagnosis of drug-resistant hypertension was based on the presence of hypertension after treatment with at least 3 antihypertensive drugs. The main results of the study are presented in the article.

Conclusions: The main results of the study are presented in the article. The analysis of the results showed that drug-resistant hypertension is a common condition that refers to cases of resistant hypertension after medical treatment. The study group consisted of 100 patients, of whom 62 were men and 38 were women. The mean age of the patients was 58.7 ± 11.9 years. The diagnosis of drug-resistant hypertension was based on the presence of hypertension after treatment with at least 3 antihypertensive drugs. The main results of the study are presented in the article.
Objective: Background: patients with suspected drug-resistant hypertension referred for non-pharmacological treatment are usually not on optimal medical therapy

Study objective: to analyse blood pressure control and composition of medical therapy in patients referred to hypertension clinic with suspected drug-resistant hypertension

Design and method: Patients and methods: group of 60 consecutive patients (34 males, 26 females, mean age 66 years) and mean BMI 30 kg/m2 with suspected drug-resistant essential underwent BP office recording, laboratory examination and echocardiographic study same date in hypertension clinic. Patients had significant comorbidities: coronary artery disease 27 %, dyslipidaemia had 88 %, DM 57 % and 78 % were smokers. Office blood pressure was measured with automatic BP monitor Omron M6 after 5 minutes rest, mean value of three recordings was used. Medical therapy was analysed from patients records.

Dual mode, Pulse-Doppler and Tissue Doppler Imaging were used for the assessment: of cardiac chambers size, left ventricular (LV) ejection fraction, calculation of LV mass index (LVMJ) and RWT (relative wall thickness).

Results: Mean systolic office BP was 146.8 mmHg and diastolic 86.9, with 82 % patients above target SBP (140 or 130) and 53 % (90 or 80) above target DBP. Total number of 37 (62 %) patients were receiving ACEIs, 30 % ARBs, 48 % CCBs and 60 % thiazide or thiazide–like diuretics, 65 % patients were on BBs and 13 % on spironolactone. Mean number of antihypertensive drugs was 3.4. Mean LVMJ was 85.5 g/m2 and RWT 0.40 with only 18 % male patients above LVMJ upper normal limit (> 102 g/m2) and 19 % females above 88 g/m2 and 37 % subjects above RWT upper normal limit.

Conclusions: Patients referred to tertiary care hypertension clinic are not on optimal medical therapy, low proportion of patients are treated with diuretics and spironolactone, high number are treated with betablockers. Despite not optimal therapy and BP control, only small number of patients had parameters of cardiac hypertrophy. Supported by Ministry of Health, Czech Republic - conceptual development of research organization (Nemocnice Na Homolce – NNH, 00023884), IGI 150505.05.

PP.15.25 REDO RENAL DENERVATION WITH NON-INVASIVE THERAPEUTIC ULTRASOUND

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Objective: To examine the real world experience with renal denervation (RDN) in a broader hypertensive population, including patients with severe and moderate resistant hypertension (RHTN) and chronic kidney disease (CKD).

Design and method: The EnligHTN II study is a prospective, 3-arm, non-randomized, multi-center clinical investigation on the safety and effectiveness of the EnligHTNö RDN System in RHTN patients. 277 adults (mean age 61.0 [SD 10.9] years, 64% male, mean office SBP 172.7 [22.3] mmHg) taking on average 4.6 [1.7] antihypertensive medications were recruited and assigned to one of three groups: Group A: office SBP >160 mmHg and eGFR > 45 mL/min per 1.73 m2 (n = 147) Group B: office SBP >140–159 mmHg and eGFR > 45 mL/min per 1.73 m2 (n = 102)

Results: All patients underwent RDN (mean number of ablations 17.2 [4.5]) and had office and 24-hr ambulatory blood pressure (BP) assessed at 6, 12, 24 and 36-months follow-up.

Results: A total of 62 patients (62% male, mean anti-hypertensive medications 4.4 [12.0]) had 36-month follow-up data (Group A: n = 38, Group B: n = 19, Group C: n = 5)

Patients in Group A demonstrated mean reductions in office and 24-hour ambulatory BP of 21.8/9.7 [28.6/15.7] mmHg and 12.0/6.6 [21.1/13.7] mmHg respectively at 36 months (fall p < 0.001). In Group B: mean reductions in office and 24-hour ambulatory BP of 11.3/7.7 [25.6/12.6] mmHg (p = 0.07/p = 0.02) and 4.8/4.1 [18.2/8.5] mmHg (p = 0.23/p = 0.04) respectively at 36 months.

In Group C: mean reductions in office and 24-hour ambulatory BP of 33.8/9.0 [22.1/10.3] mmHg (p = 0.03/p = 0.13) and 1.3/2.3 [9.6/5.9] mmHg (p = 0.75/p = 0.56) respectively at 36 months. Procedure and/or device-related serious renal artery stenosis occurred in 1.4% of the population.

Conclusions: In the clinical setting, RDN was safe and associated with a significant, sustained BP reduction in patients with severe uncontrolled hypertension (Group A). In patients with moderate uncontrolled hypertension (Group B), modest yet significant reductions in ambulatory DBP were observed.

PP.15.27 USE OF 99 MTC-HMPAO BRAIN SPECT ON PATIENTS WITH RESISTANT HYPERTENSION TO ASSESS THE SAFETY OF RENAL DENERVATION

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Objective: To determine the speed change of cerebral blood flow after radiofrequency ablation of the renal arteries in patients with arterial hypertension resistant to drug therapy

Results:

- Design and method: The study included 13 patients (average age 54.2 ± 11.4 years) with arterial hypertension resistant to drug therapy. All patients underwent office blood pressure measurement, brain SPECT with 99mTc-HMPAO at baseline and after 6 months after renal denervation.

- Results: According to office measurements, baseline blood pressure amounted to 166.9/101.1 mmHg with the decline -24.6/-14.8 mmHg 6 months after denervation (p < 0.05). When comparing indices of regional cerebral blood flow obtained when brain SPECT showed no signs of deterioration of cerebral perfusion and reduction the speed of cerebral circulation. On the contrary, in some regions of the brain marked by a significant increase in the speed of cerebral blood flow: in the right rear parietal, occipital right and left frontal and right-lower areas (p < 0.05). These results allow us to speak not only about security but also the positive impact of renal denervation on cerebral blood flow, probably due to the persistent decline in systemic arterial pressure. No patient included in the study were recorded adverse side effects related to the denervation. Dynamics of the level of blood creatinine or signs of stenosis of the renal arteries after ablation have not been identified.
PP.15.28 TREATMENT OF PATIENTS WITH ARTERIAL HYPERTENSION IN PRIMARY HEALTH CARE (ACCORDING TO THE RUSSIAN ARTERIAL HYPERTENSION REGISTER)

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Objective: To clarify the explanatory factors of carotid-femoral (C-F) pulse wave velocity (PWV) in Finnish drug-treated hypertensive patients with PWV either < 10 m/s or >9.9 m/s.

Design and method: A Doppler ultrasonography device (Micro Medical PulseTrace PWV, Micro Medical Ltd, Rochester, Kent, UK) was used to measure C-F PWV in 251 Finnish drug-treated hypertensive patients. The mean age was 60.2 (7.8) years in patients with PWV < 10 m/s (61 females and 53 males) and 67.2 (7.2) years in those with PWV >9.9 m/s (65 females and 72 males). 24 hour ambulatory blood pressure monitoring (ABPM) was performed with a portable device (90207 Ambulatory Blood Pressure Monitor, SpaceLab Inc., Washington, U.S.). Fasting plasma glucose, GlcHbA1c and lipid and urine albumin/creatinine ratio were measured. SF-36 was calculated.

Results: The mean 24 hour systolic blood pressure (SBP) was 124.2 (19.3) and diastolic blood pressure (DBP) 74.2 (12.0) mmHg in patients with PWV < 10 m/s and 133.7 (12.2) and 76.5 (6.6) mmHg in those with PWV >9.9 m/s. The mean C-F PWV was 8.3 (1.3) m/s in patients with PWV < 10 m/s and 12.8 (3.5) m/s in those with PWV >9.9 m/s. The age of the patients was 59.7 (9.1) years in patients with PWV < 10 m/s and 67.2 (7.2) years in those with PWV >9.9 m/s. According to stepwise linear regression analysis C-F PWV was explained by the amount of alcohol used/week (t = -4.718, p = 0.001), GlcHbA1c (t = 2.988, p = 0.005) and SD of the daytime systolic blood pressure (t = -2.231, p = 0.032) in patients with PWV < 10 m/s and by serum creatinine (t = 1.732, p = 0.086), age (t = 3.227, p = 0.02) and weight (t = 2.360, p = 0.02) in those with PWV >9.9 m/s.

Conclusions: Among patients with PWV < 10 m/s, higher PWV values were explained by more abundant use of alcohol, worse diabetic control and lower daytime SBP variation. Among patients with PWV >9.9 m/s, higher PWV values were explained by higher age and weight and worse renal function.

PP.15.30 MÜNCHHAUSEN SYNDROME (FACTITIOUS DISORDER) AS A CAUSE OF REPEATED HOSPITALIZATION IN THE INTENSIVE CARDIAC CARE UNIT

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Objective: A 45-year-old woman, treated for resistant hypertension, was admitted to the ICU due to another hypertensive crisis. Extensive diagnostics of secondary causes of arterial hypertension were performed.

Design and method: The abdominal Doppler ultrasound confirmed extensive kidney vascularization without signs of vascular narrowing. For this reason, the patient was disqualified from renal artery denervation, and a device was implanted to create a therapeutic arteriovenous fistula at the level of the right external iliac artery and vein. One month after the procedure, the patient reported increasing exertional dyspnea with minimal physical effort. Catheterization of the right heart showed postcapillary pulmonary hypertension, as well as characteristics of hypokinet ic circulatory arrest. Diagnosis of pulmonary arterial hypertension was made to close the therapeutic arteriovenous fistula by implanting a stent-graft. After the procedure, the symptoms of heart failure resolved, but blood pressure increased again. Therapy with eight hypotensive drugs was continued, and blood pressure values ranged from 160 to 220/90 to 120 mmHg. Considering the overall clinical presentations, it was suspected that the patient was not taking the recommended drugs. Two blood samples were collected to determine the concentration of the hypotensive agents: the first was on the day when the patient was taking the drugs on her own, and the second was on the following day when taking of the drugs was supervised.

Results: Targeted analyses of bisoprolol, chlorothalidone, doxazosin, furosemide, clonidine, nitrédinep and valsartan, as well as oza pamph and atorvastatin, were performed using high performance liquid chromatography coupled to mass spectrometry (LC-MS). Only oza pamph in nontherapeutic doses and trace amounts of atorvastatin were found in the serum collected on the day when the patient took the drugs on her own, confirming the suspicion that the patient was not taking the recommended therapy. In subsequent days, during the supervised drug administration period, a reduction of blood pressure to 90/60 mmHg was observed.

PP.15.31 LIFESTYLE FACTORS EXPLAIN CAROTID-FEMORAL PULSE WAVE VELOCITY IN FINNISH HYPERTENSIVE PATIENTS

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Objective: To explore the risk factors and efficiency of treatment of patients with arterial hypertension (AH) under care and treatment in primary health care.

Design and method: The study was carried out with the AH Register method (a software with remote access, specially trained doctors made data inputs from medical records into the Register). A selection of 2916 patients with AH from 30 regions of Russia from 2010–2015 was analysed. 35% of men (n = 1033) men younger than women by 4 years (61 ± 12 years and 65 ± 12 years respectively.

Results: 44% of males (n = 10072) and 4% (n = 916) of women were smokers low level of physical activity was registered in 30% (n = 2601) of men and 33% (n = 5199) women, overuse of alcohol in 18% (n = 1526) of men and 3% (n = 483) of women, hypercholesterolemia in 37% (n = 9385) of patients with AH; hyperglycemia in 20% (n = 5057) of patients with AH.

Analysis of arterial blood pressure revealed I stage AH in 43% (n = 12036), II stage AH in 12% (n = 3461), III stage AH in 3% (n = 998) and ABP < 140/90 mm Hg in 38%. Monotherapy in patients with AH in the total sample was carried out in 24.7% of patients; dual therapy – in 58% of cases and triple therapy – in 17%. In most cases, ACE inhibitors (65%), β-blockers (43%) and thiazide diuretics (37%) were recommended.

Conclusions: High prevalent factor risks and population patients with arterial hypertension, observed in primary health care and treated were not optimal, only 38% had BP level < 140/90 mm Hg.

PP.15.32 NEW MODEL TO INVESTIGATE THE INFLUENCE OF AIRCRAFT NOISE IN THE PATHOPHYSIOLOGICAL CONCEPT OF HYPERTENSION

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Objective: Epidemiological studies have found a link between aircraft noise exposure and increased incidence of arterial hypertension and thus cardiovascular disease. The underlying pathophysiological mechanisms are not yet fully understood. The kidney acts as a long-term regulator of blood pressure and controls the extracellular sodium and water balance. Animal work and clinical studies show that mental stress affects the renal plasma flow and central hemodynamics.

Design and method: We could establish a model to analyse the influence of 30 minutes standardized aircraft noise with a maximal sound pressure level of 80 dB on renal and central hemodynamics in 80 healthy volunteers. Renal hemodynamics were investigated using the clearance analysis with infusion of paraaminohippuric acid (PAH) and Inulin. Central hemodynamics were analysed using cardiac impedance tomography.

Results: Cardiac impedance tomography showed no difference in RR-ECG duration (978 ± 143 vs. 907 ± 199 ms, p = 0.072), heart frequency (63 ± 9 vs 66 ± 10 bpm, p = 0.130), cardiac index (3.3 ± 0.65 vs 3.5 ± 0.82 L/min/m², p = 0.330) and total peripheral resistance index (2031 ± 622 vs 2032 ± 655, p = 0.998) in persons after noise exposure compared to sham exposed individuals. There were no significant differences in renal plasma flow (698 ± 124 vs. 693 ± 123 ml/min, p = 0.215) and glomerular filtration rate (152 ± 19 vs 151 ± 18 ml/min, p = 0.626) between noise and sham exposed individuals. There was an increase in renal plasma flow following baseline (688 ± 120 ml/min) and noise exposure (698 ± 124 ml/min, p = 0.011).

Conclusions: We established a model to investigate the influence of aircraft noise on renal and central hemodynamics. In healthy individuals there was no change in central hemodynamics caused by short term aircraft noise exposure. Renal plasma flow increased between baseline and noise exposure, possibly pointing to a change in renal hemodynamics. We plan to extend our population to 44 hypertensive patients.
**PP.15.33** PROGNOSIS OF LONG-TERM PHYSICAL EXERCISES EFFICACY IN HYPERTONIC PATIENTS

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**Objective:** Aim of study: In the end of academic year to assess the efficacy of physical exercises program in hypertonic patients by using the tolerance test to physical exertion and restoration rate of cardiac contractions after it.

**Design and method:** It was examined 57 patients, aged 63 (56;67) with achieved target ranges of arterial pressure, included in the regular physical exercises program for 1 academic year (9 months). Before the beginning of the exercises and in the end of the academic year it was carried out the bicycle ergometry test with the analysis of restoration rate of cardiac contractions during 5 minutes of after-exertion period. The test was determined like difference between the threshold level of restoration rate of cardiac contractions and restoration rate of cardiac contractions in the end of each minute. Initially with the help of all patients divided into 2 subgroup. They were nominally defined as groups with “rapid” (1st group) restoration after bicycle ergometry and “slowly” (2nd group) one (p = 0.001).

**Results:** With the help of discriminative analysis it was obtained the formula letting predict the efficacy of standard programs of hypertonic patients rehabilitation before the beginning of long-term.

**Conclusions:** Annual dynamics of the parameters showed that the patients with initial high restoration rate of cardiac contractions after the bicycle ergometry improved their results and working efficiency for the end of rehabilitation cycle. And those patients, who had low restoration rate of cardiac contractions after bicycle ergometry in 73% cases didn’t improve their results for the beginning of the year. And in our opinion, it is required an individual approach and the selection of other types of exercising regimes for such category of the patients.

**PP.15.34** PULSE WAVE VELOCITY AND RENAL RESISTIVE INDEX IN PATIENTS WITH RESISTANT HYPERTENSION: RELATION TO BLOOD PRESSURE CHANGES AFTER RENAL DERENERVATION

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**Objective:** Patients with resistant hypertension (RHTN) are characterized by higher incidence and severity of vascular damage and blood pressure (BP) decrease usually results in subsequent reduction of arterial stiffness assessed by pulse wave velocity (PWV). In kidneys renal resistive index (RRI) appears to be a good marker of vascular damage and may serve as a predictor of rapid loss of a renal function in cardiovascular diseases. Aim of study was to assess association between PWV and RRI and their changes after effective treatment of RHTN.

**Design and method:** 22 patients (mean age 56 ± 10 years, 9 males) with confirmed true RHTN underwent renal denervation (Symplicity RDN System, Medtronic, USA) between January 2012 and October 2015. Markers of vascular damage and blood pressure (BP) were evaluated before and twelve months after procedure. RRI was noninvasively assessed by ultrasonography (Vivid 7 Dimension, GE, USA), PWV with central BP calculation by applanation tonometry (Sphygmcor XCEL, AtCor Medical, Australia) and blood pressure levels by 24-hour blood pressure monitoring, ABPM (BP Lab, Petre Telehin, Russia). During follow-up all patients were on stable medication therapy with mean 4.2 ± 1.4 antihypertensive drugs.

**Results:** There was a significant decrease of both office, 24-hour mean BP (-24.5/13.2 mmHg and -10.7/7.3 mmHg respectively, \(p < 0.05\)) and central BP (-17.5/14.2 mmHg, \(p < 0.05\)) levels a year after RDN. Arterial stiffness measured by PWV improved significantly 12 months after procedure (10.1 ± 1.8 to 9.3 ± 2.0 m/s, \(p < 0.05\)). However change in PWV was associated only with decrease of central BP (\(r = 0.717, p < 0.05\)). Patients with RHTN were characterized by rather high RRI at baseline and values remained mostly unchanged during follow-up (0.7 ± 0.08 and 0.71 ± 0.08 respectively; \(p = 0.87\)). There was lack of association between PWV and RRI changes (\(p = 0.3\)) or between BP and RRI changes during follow-up (\(p = 0.8\)).

**Conclusions:** Aortic stiffness assessed by PWV improved after successful treatment of resistant hypertension and mostly correlated with decrease of central BP. However marker of renal vascular damage, RRI, has lack of association with change of BP levels and PWV 12-months after renal denervation.

**PP.15.36** MORE EFFECTIVE METHOD TO REDUCE SALT INTAKE BY USING DR’S RESTAURANT AND MEASURING SALT INTAKE FROM URINARY ANALYSIS

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**Objective:** In general, out eating menu at restaurant supply high calorie foods and salty foods in Japan. So it is difficult to eat healthy foods when eating out for hypertension or diabetic patients. So it is hard to educate patients how to cook low calorie food and low salt diet food. In addition to it, our prefecture marked highest salt intake and highest cardiovascular death rate in Japan. So we opened doctor’s restaurant Ichigeya in front of our clinic since September 2013 (at Kitakami city Iwate prefecture, Japan), in order to present more effective nutritional guidance from registered dietitians and by watching how to cook the low salt diet foods.

**Design and method:** In the Dr’s restaurant, we supplied healthy menu and therapeutic menu as well as ordinary Japanese menu. Healthy menu contains approximately 600 kilocalories, total salt of foods contains less than 2.5 g, total amount of the vegetables is over 120 g. Therapeutic menu are for anemia patient (iron rich food), for kidney disease patients (low protein and potassium food), for gout patient (low purine body diet) and so on. We have held healthy dinner event 13 times in total. In the event our clinic staff broadcasts the healthy cooking methods to the TV at the main hall of the restaurant, by using handy video camera. In order to evaluate the amount of salt intake, we measured sodium concentration in the second urine after getting up and calculated the estimated amount of salt intake per day using Tanaka’s method.

**Results:** The total order of healthy menu was 4157 meals/year(2015). Healthy dinner cooking live demonstration has held 13 times in total. Number of participants are 413 in total. Estimated salt intake was 9.1 g, which was less than the average of our Iwate prefecture in Japan (12.9 g).

**Conclusions:** It is great help for patients to understand low salt diet by real eating low salt diet food and low calorie diet food and real watching how to cook low salt diet food.

**PP.15.37** REDUCED RATE AND DURATION OF HYPERTENSION-RELATED HOSPITALIZATION AFTER TREATMENT WITH BAROREFLEX ACTIVATION THERAPY

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**Objective:** Baroreflex activation therapy (BAT) has been shown to lower blood pressure in patients with resistant hypertension. It is not known, however, whether this translates into a reduction of relevant clinical endpoints. Therefore, we investigated hospitalization rates before and after initiation of BAT.

Objective: The aim is to analyze the profile of monocyte chemoattractant protein-1 (MCP-1) in patients with resistant hypertension and the association of this chemokine involved in the recruitment of monocytes and macrophages with diastolic blood pressure.

Design and method: After patients’ written informed consent, records on hospitalization were available for a period of 1 year before BAT activation in 2 patients and 2 years before BAT activation in 22 patients. Follow-up after BAT activation was 1259 ± 498 days. The total number of hospitalizations was 3.3 ± 3.5 per year before BAT and 2.2 ± 2.7 per year after BAT (p = 0.03). Hospitalizations related to hypertension were significantly decreased from 1.5 ± 1.7 per year before BAT to 0.5 ± 0.9 per year after BAT (p < 0.01), controlled hospitalization for BAT implantation was not counted. The cumulative duration of hypertension-related hospital stays was significantly reduced from 8.3 ± 9.1 days per year before BAT to 1.8 ± 4.8 days per year after BAT (p < 0.01). Office cuff blood pressure was 177 ± 26 over 99 ± 17 mmHg before BAT and 154 ± 32 over 90 ± 17 mmHg at latest follow-up (p < 0.01 for systolic and diastolic blood pressure).

Conclusions: Besides the known reduction in blood pressure, BAT lowered the rate of hospitalizations related to hypertension in patients with severe resistant hypertension, suggesting that the positive effect of BAT on blood pressure may translate into a reduction of relevant clinical endpoints.

Table 1: Baseline characteristics of patients considering demographic variables, target organ lesions, and risk factors grouped according to MCP-1 levels.

<table>
<thead>
<tr>
<th>MCP-1 level</th>
<th>All patients (n = 24)</th>
<th>Patients with MCP-1 ≥ 271 pg/ml (n = 12)</th>
<th>Patients with MCP-1 ≤ 271 pg/ml (n = 12)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>60.0 ± 8.8 years</td>
<td>57.5 ± 6.1 years</td>
<td>62.5 ± 10.2 years</td>
<td>0.04</td>
</tr>
<tr>
<td>Male sex</td>
<td>14 (58.3%)</td>
<td>7 (58.3%)</td>
<td>7 (58.3%)</td>
<td>0.83</td>
</tr>
<tr>
<td>Obesity</td>
<td>11 (45.8%)</td>
<td>5 (41.7%)</td>
<td>6 (50.0%)</td>
<td>0.71</td>
</tr>
<tr>
<td>Diabetes</td>
<td>10 (41.7%)</td>
<td>5 (41.7%)</td>
<td>5 (41.7%)</td>
<td>0.91</td>
</tr>
<tr>
<td>Current smoking</td>
<td>8 (33.3%)</td>
<td>4 (33.3%)</td>
<td>4 (33.3%)</td>
<td>0.90</td>
</tr>
<tr>
<td>Current alcohol use</td>
<td>6 (25.0%)</td>
<td>3 (25.0%)</td>
<td>3 (25.0%)</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Target organ damage and laboratory data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>All patients (n = 24)</th>
<th>Patients with MCP-1 ≥ 271 pg/ml (n = 12)</th>
<th>Patients with MCP-1 ≤ 271 pg/ml (n = 12)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum creatinine (mg/dl)</td>
<td>0.9 [0.6]</td>
<td>0.9 [0.6]</td>
<td>0.9 [0.6]</td>
<td>0.97</td>
</tr>
<tr>
<td>eGFR (%</td>
<td>75.3</td>
<td>75.3</td>
<td>75.3</td>
<td>0.80</td>
</tr>
<tr>
<td>UAR (mg)</td>
<td>14.0 [14.0]</td>
<td>14.0 [14.0]</td>
<td>14.0 [14.0]</td>
<td>0.05</td>
</tr>
<tr>
<td>UAR &gt;300mg/dl (n = 24)</td>
<td>32.4</td>
<td>33.5</td>
<td>31.3</td>
<td>0.18</td>
</tr>
<tr>
<td>PVR, (mmHg)</td>
<td>10.3 [7.3]</td>
<td>10.3 [7.3]</td>
<td>10.3 [7.3]</td>
<td>0.53</td>
</tr>
<tr>
<td>PWV (cm/s)</td>
<td>17.4</td>
<td>17.4</td>
<td>17.4</td>
<td>0.06</td>
</tr>
<tr>
<td>LVMI</td>
<td>117 [70.4]</td>
<td>117 [70.4]</td>
<td>117 [70.4]</td>
<td>0.44</td>
</tr>
<tr>
<td>LVTh (%)</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>0.90</td>
</tr>
<tr>
<td>BP (mmHg)</td>
<td>14.0 [14.0]</td>
<td>14.0 [14.0]</td>
<td>14.0 [14.0]</td>
<td>0.94</td>
</tr>
</tbody>
</table>

-established cardiovascular disease

Conclusions: Besides the known reduction in blood pressure, BAT lowered the rate of hospitalizations related to hypertension in patients with severe resistant hypertension, suggesting that the positive effect of BAT on blood pressure may translate into a reduction of relevant clinical endpoints.

Table 2: Changes in cardiovascular risk factors and target organ damage after 2 years follow-up.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>24 months</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP (mmHg)</td>
<td>169.7</td>
<td>154.8</td>
<td>0.02</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>93.4</td>
<td>82.3</td>
<td>0.02</td>
</tr>
<tr>
<td>UAER (mg/24h)</td>
<td>38.9</td>
<td>23.4</td>
<td>0.03</td>
</tr>
<tr>
<td>CRP (mg/dl)</td>
<td>0.8</td>
<td>0.5</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Conclusions: Besides the known reduction in blood pressure, BAT lowered the rate of hospitalizations related to hypertension in patients with severe resistant hypertension, suggesting that the positive effect of BAT on blood pressure may translate into a reduction of relevant clinical endpoints.

Design and method: Cross-sectional study was performed in 426 resistant hypertensive patients who underwent serum MCP-1 measurement between March 2011 and February 2012. During the outpatient follow-up, clinical examination, anthropometric measures, and office and ambulatory blood pressure measurement were performed. Beyond that, cardiovascular events and subclinical cardiovascular disease through urinary albumin excretion rate, echocardiogram and pulse wave velocity were assessed close to serum MCP-1 dosage. When suitable, T test, Mann Whitney or X2 test were done to compared in MCP-1 values above and below the median (271 pg/ml). Simple correlation and multiple linear regression adjusted for the main inflammatory and athrogenic confounding factors were used to verify the association between MCP-1 and the analyzed parameters, notably cardiovascular risk factors and target organ damage.

Results: There was a significant prevalence of cerebrovascular disease and chronic kidney disease (GFR < 60 ml/min/1.73m2) among patients with MCP1 above 271 pg/ml, as shown in the table. The correlations between MCP1, anthropometric parameters, office BP, antihypertensive use and ABPM were not significant. There were weak and significant correlations between MCP1 and mean pulse wave velocity (r = 0.11, p = 0.027) and between MCP-1 and the presence of cerebrovascular diseases (r = 0.14, p = 0.004), as suggested by bivariate analysis. However, the relationship was reversed for MCP1 and coronary artery disease (r = -0.10, p = 0.042). Adjusting for the main cardiovascular risk factors, just pulse wave velocity and stroke were determinant for the MCP-1 values in the multivariate logistic regression model, as seen in figure. Values are described as means, standard deviations or percentages, except creatinine, UAER and CRP with median and interquartile range.

Conclusions: Among patients with resistant hypertension, endothelial and atherosclerotic mechanisms have demonstrated associations between high levels of the chemotactic cytokine (MCP-1) and established cerebrovascular disease, subclinical kidney disease, and pulse wave velocity.

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Objective: Resistant hypertension (RHTN) and type 2 diabetes mellitus (T2DM) are leading causes for chronic kidney disease (CKD) involving increased sympathethic activity. The aim of this study was to evaluate effect of sympathethic renal denervation (RDN) on renal function in patients with RHTN and T2DM.

Design and method: Fourty seven patients (pts) with true RHTN and T2DM (mean age 60.0 ± 8.8 years, mean office blood pressure (BP) 169.7 ± 19.1mmHg, mean eGFR 74.4 ± 21.7 ml/min/1.73m2, mean HbA1c 6.7 ± 1.4%, 18 male) were included in single-arm prospective interventional study (detailed protocol was published on ClinicalTrial.gov, number NCT014998910). Office BP measurement, ambulatory 24-hour BP, renal Doppler ultrasound and assessment of renal function (eGFR according to MDRD formula, urinary albumin excretion (UAEx)) and HbA1c levels were performed at baseline and follow up. On average, patients were taking 4 (3–5) antihypertensive drugs at optimal dosages, including a diuretic. None of the patients changed the antihypertensive treatments during follow-up. Six, 12 and 24 months follow up were completed by 42, 38 and 15 pts, respectively.

Results: RDN reduced 24h-SBP at 6, 12 and 24 months by 10.9/6.8, 12.4/6.9 and 12.8/7.4mmHg, respectively, for p all < 0.01. A 24h-SBP drop >10 mmHg (defined as response) occurred in 59%, 63%, and 67% pts at 6, 12 and 24 months, respectively, without any renal artery damage. The number of pts with stage 3 CKD (defined as eGFR < 60 ml/min/1.73m2), was 21% at baseline, and did not changed after 6, 12 and 24 months (28%, 37% and 42% pts, respectively, P = 0.5, 0.13 and 0.10, respectively). Initially, 33% had normal UAEx, 33% had microalbuminuria (MAU), and none of the patients had overt proteinuria. After 6, 12 and 24 months the number of patients with normal UAEx were not changed (69%, 72%, and 82%, respectively, P = 0.05), however the mean value of UAEx was decreased (from 38.3 ± 33.6 to 23.4 ± 23.4 mg/24h, p = 0.04 after 6 months, and from 33.3 ± 30.7 to 12.5 ± 12.4 mg/24h, p = 0.03 after 24 months). Reduction of MAU was not associated with response.

Conclusions: RDN stabilized renal function in patients with RHTN and T2DM within 2 years. Moreover, after RDN there was decrease of microalbuminuria.
Objective: Both the type 2 diabetes mellitus (T2DM) and resistant hypertension (RHTN) are associated with increased of renal sympathetic nerve activity and reduction renal blood flow. The aim of this study was to evaluate effect of renal denervation (RDN) on renal hemodynamics in patients with RHTN and T2DM.

Design and method: Forty seven patients with true RHTN and T2DM (mean age 60.0 ± 8.8 years, mean office blood pressure (BP) 169.7 ± 19.1mmHg, eGRF 74.4 ± 21.7 mL/min/1.73m² (according to MDRD formula), mean HbA1c 6.7 ± 1.4%, 18 male) were included in single-arm prospective interventional study (detailed protocol was published on ClinicalTrial.gov, number NCT01499810). Office BP measurement, ambulatory 24-hour BP, renal Doppler ultrasound (with measured of renal resistive index (RRI)) and assessment of renal function, HbA1c levels were performed at baseline and follow up. On average, patients were taking 4 (3–5) antihypertensive drugs at optimal dosages, including a diuretic. None of the patients changed the antihypertensive treatments during follow-up. Twelve months follow up was completed by 38 pts.

Results: RDN reduced both office BP and 24h-BP at 12 months by 25.4/12.5 mmHg and 12.4/6.9mmHg, p < 0.01 respectively. The mean values of RRI were no change after RDN. There were increasing RRI in 19% pts, no change in 47% pts and decreasing in 34% pts after 12 months. Decrease in RRI in trunks after 12 months was significantly correlated with decrease both in 24h-diastolic BP (DBP) and night-DBP (r = 0.41, p = 0.03 and r = 0.43, p = 0.03, respectively), as well as with reduction in load of 24h-DBP and night-DBP (r = 0.41, p = 0.04 and r = 0.39, p = 0.04, respectively). Reduction of RRI in segmental arteries was associated with increase in heart rate standard deviation (HRSD) (r = -0.48, p = 0.01 for 24h-HRSD and r = -0.47, h = 0.015 for night-HRSD).

Conclusions: Mean values of renal resistive index were not changed within one year after renal denervation in patients with RHTN and T2DM; however, increases in HRSD, reflecting positive effect on the autonomic nervous system, and decreases in diastolic BP were associated with improvement of renal hemodynamics.

ADIPOKINES IN RESISTANT HYPERTENSION WITH OR WITHOUT TYPE 2 DIABETES MELLITUS

A. Falkovskaya, V. Mordovin, S. Pekarskiy, G. Semke, T. Ripp, I. Zavybanova, V. Lichkaki, A. Gusakova. Cardiology Research Institute, Tomsk NRMC., Tomsk, Russia

Objective: As adipokines relates with increases sympathetic activity and hyperinsulinemia, we aimed to assess the relationship between blood pressure (BP) and plasma adiponectin, leptin and resistin levels in resistant hypertension (RHTN), comparing the groups with and without type 2 diabetes mellitus (T2D).

Design and method: Forty four RHTN pts (mean age 56.2 ± 8.6 years; mean 24 h BP: 162/91 mmHg; 20 male (46%)) underwent ambulatory BP monitoring, evaluating body mass index (BMI), plasma adiponectin, leptin and resistin concentrations.

Results: Similar values of adiponectin, leptin and resistin were found in the T2D group (n = 17) and the non-T2D (n = 27) (p > 0.05). There were positively correlations of leptin level with BMI in both groups (r = 0.75, p = 0.00 for non-T2D and r = 0.71, r = 0.02 for T2D). The non-T2D pts with obesity (n = 19) have higher plasma leptin levels than those without (n = 8) (50.8 ± 25.2 vs. 18.4 ± 16.5ng/ml, p = 0.003), whereas in the T2D group plasma leptin level had no significant difference in the pts with (n = 4) and without obesity (n = 13) (27.6 ± 17.9 vs. 46.9 ± 25.6 ng/dL, p = 0.19). Furthermore, pts with obesity have similar leptin level in the non-T2D and T2D groups (p=0.5). Values of adiponectin and resistin were similar in pts with and without obesity in both groups. Plasma leptin positively correlated with variability of 24 h systolic BP (SBP) and diastolic BP (DBP) in the non-T2D group (r = 0.41, P = 0.04 and r = 0.40, p = 0.04) and negatively correlated with the nighttime drop in SBP and DBP in the T2D group (r = -0.62, P = 0.01 for SBP and r = -0.59, P = 0.02 for DBP). Plasma adiponectin negatively correlated with SBP-24 h (r = - 0.54, p = 0.04), SBP-day (r = -0.57, h = 0.03), loads of SBP-24 h (r = -0.64, p = 0.009) and loads of SBP-day (r = -0.57, p = 0.03) only in the T2D group, whereas plasma resistin positively correlated with BP only in the non-T2D group (r = 0.56, p = 0.02 for SBP-24 h, r = 0.67, p = 0.000 for DBP-24 h).

Conclusions: These findings suggests that RHTN pts with or without type 2 diabetes have similar values of adipokines, but those adipokines differently contribute to blood pressure abnormalities in these groups. Plasma leptin has close relationship with BMI, and obesity RHTN pts have similar plasma leptin level regardless of the presence of T2D.
**POSTER SESSION**

**POSTERS’ SESSION PS16:**

**BLOOD PRESSURE MEASUREMENT AND VARIABILITY**

**PP.16.01**

**A NEW INNOVATIVE ALGORITHM FOR ATRIAL FIBRILLATION DETECTION DURING BLOOD PRESSURE MONITORING: CARDIOAFIB (PIC SOLUTION) VS THE OLD ALGORITHM IN THE MICROLIFE BP A200**

L. Prati¹, V. Pecchioli¹, G. Germano², F. Fedele², ¹Asl Frosinone, Frosinone, Italy, ²Policlinico Umberto I, Università La Sapienza, Roma, Italy

**Objective:** Aim of our study: to evaluate the sensitivity and the specificity for atrial fibrillation detection during the brachial blood pressure monitoring with two oscillometric devices that have a dedicated algorithm (ARR vs Afib/MAM): CardioAfib vs Microlife BP A200 Plus.

**Design and method:** we enrolled a total of 80 hypertensive patients referred to our center (40 males, 40 females). Of these, 40 were suffering from atrial fibrillation and 40 were in stable sinus rhythm. Enrolled patients were subjected to clinical measurement of blood pressure as with the unit CardioAfib (Pic Solution) plus ARR technology with three manual consecutive measurements (guidelines ESC / ESH) as Microlife BP A200 Plus with MAM Technology that performs three consecutive blood pressure automatic measurements in every session and at the same time in 12-lead ECG surface characteristics for the feedback of the patient’s rhythm. Was considered significant, for the possible presence of atrial fibrillation, the appears, on the display of the two devices, of the Afib indicator.

**Results:** The sensitivity of three consecutive measures, for AF detection with CardioAfib device was 98.33%, the specificity was 96% and IC95% ± 0.06. The sensitivity of BP A200 Plus Microlife was 97.5%, specificity 92.11%, IC95% ± 0.30.

**Conclusions:** the two devices for blood pressure monitoring with oscillometric modality have both high sensitivity and specificity for atrial fibrillation. This fact is very important in a correct thromboembolic prevention strategy because the early AF detection reduces the stroke incidence.

**PP.16.02**

**ASSOCIATION BETWEEN AMBULATORY BLOOD PRESSURE VALUES AND CENTRAL AORTIC PRESSURE IN LARGE POPULATION OF NORMOTENSIVE AND HYPERTENSIVE SUBJECTS**

J. Polonia¹, A. Rouxinol-Dias¹, S. Araujo¹, J. Silva², L. Barbosa², ¹Faculty of Medicine of Porto / Contexto, Porto, Portugal, ²Hypertension Unit, Matosinhos Local Health Unit, Matosinhos, Portugal

**Objective:** Ambulatory blood pressure monitoring (ABPM) and central aortic blood pressure (CBP) are well known predictors of cardiovascular outcome. Our aim was to examine the association of ABPM and CBP data in a large set of normotensive and hypertensive subjects and its relation with pulse wave velocity (PWV).

**Design and method:** Study was done in a single centre and included 2108 subjects (53% female, 85% hypertensives patients, ageing 54±15years, BMI 28±5 Kg/m²) who carried out a 24 h ambulatory blood pressure monitoring (ABPM), measurement of central BP from the aortic waveform (SphygmoCor) and carotid – femoral PWV (Complior).

**Results:** Age, systolic blood pressure (SBP) of 24 h, daytime and nighttime, central BP, augmentation index (Aix) were correlated significantly to each other and all with PWV (R between 0.110-0.367, p < .001). Subjects were divided according to the presence of normal or abnormal values of ABPM and CBP and the correspondent PWV values were determined. Normal ABPM and CBP occurred in 16.5% (G1) and abnormal ABPM and CBP occurred in 58.9% (G4). Abnormal ABPM and normal CBP occurred in 4.1% (G2) and normal ABPM and abnormal CBP in 41.1% (G3). PWV (m/s) significantly increased (ANOVA p < 0.001) from G1 (9.1±2.1), G2 (9.3±2.5), G3 (10.3±2.7) to G4 (11.1±3.0).

**Design and method:** Study was done in a single centre for 3 months in 2016 and involved 118 consecutive hypertensive patients (60 female, ageing 56±17years, BMI 27±4 Kg/m²) who were scheduled to carry out a 24 h ambulatory BP monitoring (ABPM) and who, in the interval of 48 hours that include ABPM, were also submitted to evaluation of usual BP (average 3 measurements), to an unattended 3 BP measurements separated by 2 minutes with a preprogrammed device (OMRON M10-IT), and to measurement of central BP from the aortic waveform (SphygmoCor).

**Results:** As shown in table the difference casual-unattended SBP was remarkable. Also, it persisted (14–16 mm Hg) along the tertiles of distribution of unattended SBP, whereas the differences of 24 h SBP, daytime BP and central SBP minus unattended of SBP significantly decreased from the lower to the upper tertiles.

**Conclusions:** Along all the range of values, the unattended BP measurement significantly underestimate by 16/5 mmHg the BP values recorded in office thereby being more close to the 24 h and central (SBP) and to daytime (DBP) values. This must be considered when risk stratification is based on BP targets taken from unattended measurements.

**PP.16.04**

**AMBULATORY BLOOD PRESSURE MONITORING PROFILE IN A CROSS-SECTIONAL ANALYSIS OF A LARGE DATABASE OF REAL OR SUSPECTED HYPERTENSIVE PATIENTS**

J. Polonia¹, S. Araujo¹, A. Rouxinol-Dias¹, J. Silva², ¹Faculty of Medicine of Porto, Porto, Portugal, ²Hypertension Unit, Matosinhos Local Health Unit, Matosinhos, Portugal

**Objective:** It has been discussed how unattended blood pressure (BP) measurement as done in SPRINT study correlates with other forms of BP evaluation which have been shown to be highly predictive of cardiovascular outcome.

**Design and method:** Study was done in a single centre and involved 118 consecutive hypertensive patients (60 female, ageing 56±17 years, BMI 27±4 Kg/m²) who were scheduled to carry out a 24 h ambulatory BP monitoring (ABPM) and who, in the interval of 48 hours that include ABPM, were also submitted to evaluation of usual BP (average 3 measurements), to an unattended 3 BP measurements separated by 2 minutes with a preprogrammed device (OMRON M10-IT), and to measurement of central BP from the aortic waveform (SphygmoCor).

**Results:** As shown in table the difference casual-unattended SBP was remarkable. Also, it persisted (14–16 mm Hg) along the tertiles of distribution of unattended SBP, whereas the differences of 24 h SBP, daytime BP and central SBP minus unattended of SBP significantly decreased from the lower to the upper tertiles.

**Conclusions:** Along all the range of values, the unattended BP measurement significantly underestimate by 16/5 mmHg the BP values recorded in office thereby being more close to the 24 h and central (SBP) and to daytime (DBP) values. This must be considered when risk stratification is based on BP targets taken from unattended measurements.
Objective: To evaluate ambulatory blood pressure monitoring (ABPM) parameters in a broad sample of hypertensive patients.

Design and method: A total of 26,304 individual ABPM were analyzed corresponding to real or suspected hypertensive patients observed in or referred to a FHS excellence center (1995–2015). Mean blood pressures at daytime (dayBP), nighttime (nightBP), 24-hour period (24hBP) and morning surge (Morn BP) were measured. Circadian patterns were defined facing nocturnal systolic BP fall: extreme dipper (ED> 20%), dipper (D10%-20%), non-dipper/riser (NDR) (< 10% or nocturnal BP increase).

Results: Population was 52% female, ageing 58±15 years, BMI 27±5 Kg/m². Under the criteria of ABPM normality, 16.9% were normotensive (NT), 50.3% were untreated or uncontrolled hypertensives (nonHT) and 32.6% were controlled hypertensive (cHT). In the group of NT 45.1% had casual BP > 140/90 mmHg (false uncontrolled/resistant HT). In group of nonHT 16.1% had casual BP < 140/90 mmHg (masked hypertension). The 24hBP, dayBP, and nightBP values were lower than those obtained at the office regardless of normotensive hypertensive status. Age was the most important determinant of NDR. The 24hBP values were lower than those obtained at the office irrespective of normo- or hypertensive status. In the group of NT 45.1% had casual BP > 140/90 mmHg (false uncontrolled/resistant HT). In group of nonHT 16.1% had casual BP < 140/90 mmHg (masked hypertension). The 24hBP, dayBP, and nightBP values were lower than those obtained at the office regardless of normo- or hypertensive status. Nighttime (nightBP) values were lower than those obtained at the office regardless of normotensive or hypertensive status. Nocturnal SBP fall (in %) was higher in NT vs nonHT (11.3±6.7, vs 10.6±7.7 vs 9.9±8.0, p<0.000). Morn BP was lower in NT vs nonHT (22±13 vs 23±16 vs 25±19, p<0.000).

Conclusions: We confirm the presence of a marked discrepancy between casual and ABPM values, with a high percentage of occurrences of abnormal circadian BP rhythms (cHT) irrespective of casual BP. The rates of ABPM control are more than double of that of casual BP. The study reinforces the importance of ABPM in the clinical evaluation of the hypertensive status.
Conclusions: The results of this analysis support the hypothesis that in patient with type 2 diabetes a lack of stable control of ambulatory BP is related to established CVD and increased risk of CVD events.

PP.16.08 AN ASSESSMENT OF THE ACCURACY OF HOME BLOOD PRESSURE MONITORS WHEN USED IN DEVICE OWNERS

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Objective: To examine the accuracy of home BP devices when used in device owners compared to the auscultatory reference standard

Design and method: Eighty-five consecutive consenting subjects 18 years of age or greater, who owned an oscillometric home BP device (wrist or upper-arm device), with BP readings between 80–220/50–120 mmHg, and with arm circumferences between 25–43 cm were studied. Pregnancy and atrial fibrillation were exclusion criteria. Device measurements from each subject’s home BP device were compared to simultaneous two-observer auscultation using a mercury sphygmomanometer. Between-group mean comparisons were conducted using paired t-tests. The proportion of patients with device-to-auscultatory differences of 5, 10 and 15 mmHg or greater were tabulated and predictors of systolic and diastolic BP differences were identified using linear regression.

Results: Mean age was 66.4 ± 11.0 years, mean arm circumference was 32.7 ± 3.7 cm, 54% were female and 78% had hypertension. Mean BPs were 127.2 ± 14.4/72.9 ± 10.4 mmHg for home BP devices versus 129.0 ± 14.7/72.9 ± 9.3 mmHg for auscultation (difference of -3.3 ± 7.3/0.9 ± 6.1; p-values < 0.0001 for systolic and 0.17 for diastolic). The proportion of devices with systolic or diastolic BP differences from auscultation of 5, 10 and 15 mmHg or greater was 69%, 29% and 7%, respectively. Increasing arm circumference was a statistically significant predictor of higher systolic (parameter estimate 0.61 per cm increase; p-value 0.004) and diastolic (0.38; 0.03) BP.

Conclusions: Although mean differences from two-observer auscultation were acceptable when tested on their owners, most home BP devices were not accurate to within 5 mmHg. Ensuring acceptable accuracy of the device-owner pairing should be prioritized.

PP.16.10 BLOOD PRESSURE CONTROL IN PATIENTS OLDER THAN 60 YEARS WITH HYPERTENSION IN THE RESEARCH PROGRAM, AND IN CLINICAL PRACTICE

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Objective: to evaluate the control of blood pressure (BP) in patients older than 60 years with arterial hypertension (AH) 1–2 degree in implementation of research programs and clinical practice for 4 years follow-up.

Design and method: The study included 50 people, aged over 60 years with arterial hypertension of 1–2 degrees. The patients received nifedipine with controlled release, ACE inhibitor (enalapril) with assessing the effectiveness of treatment during a year. We evaluated the level of office systolic and diastolic blood pressure (SBP and DBP), and ambulatory blood pressure monitoring (ABPM) (BP Lab, Peter Taelegen). After 4 years of the end of the study the actual treatment, the values of office BP and ABPM were analyzed.

Results: After 4 years 47 people (94%) continued pharmacotherapy. 3 patients (6%) self-discontinued antihypertensive drugs. Office BP values were 127.7 ± 2.4 and 78.1 ± 2.6 mmHg. After 4 years office BP values were 137.4 ± 9.8 and 83.4 ± 8.1 mmHg (p < 0.05). According to the first ABPM, daily BP was 126.0 ± 7.3 and 77.5 ± 3.5 mmHg, in daytime 132.4 ± 7.2, and 79.4 ± 4.1 mmHg, at night 19.2 ± 9.8 and 69.1 ± 5.1 mmHg. Abnormal circadian pattern for SBP was observed in 7% ± 14%, for DBP - 34%, with a predominance of non-dippers. After 4 years, the average blood pressure indicators for the day, nighttime and daytime were, respectively: 139.5 ± 13.7 and 85.3 ± 5.8 mmHg (p < 0.01); 141.4 ± 9.4 and 81.2 ± 4.6 mmHg (p < 0.01); 129.2 ± 11.1 and 73.5 ± 5.7 mmHg (p < 0.05). After years in 60% cases of the pathological profile on SBP and in 52% on DBP have been observed. Non-dippers were dominated: 43% and 35% in SBP and DBP, respectively, the night-pickers were revealed in 18% for systolic, and in 15% for DBP.

Conclusions: Monitoring of the group of patients during the research program with regular medical supervision has provided the pronounced antihypertensive effect and more stable blood pressure control than patients in clinical practice.

PP.16.11 RELATIONSHIP BETWEEN BLOOD PRESSURE VARIABILITY AND COGNITIVE FUNCTION IN ELDERLY PATIENTS WITH STRICT BLOOD PRESSURE CONTROL

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Objective: Although higher blood pressure (BP) level and BP variability has been associated with decline cognitive function, data are sparse regarding to the relationship between BP variability and cognitive function in elderly patients with strict BP control. The aim of this study is to test the hypothesis whether BP variability using ABPM would be associated with cognitive function assessed by MoCA in the population who has already achieved strict home BP control from DCAP Network.

Design and method: We analyzed 232 patients from the Disaster Cardiovascular Prevention (DCAP) network, which developed a web-based home BP monitoring to achieve BP control for the support in disaster area after East Japan Earthquake. All patients were performed ambulatory BP monitoring and the Japanese version of Montreal Cognitive Assessment (MoCA-J).

Results: The mean age was 77.7 years, 33.6% were male, and 85.3% were administered antihypertensive drug. Average 24-hour BP level was 118.7 ± 10.0 /68.3 ± 6.4 mmHg. When we divided weighted standard deviation of systolic BP (SBP) as measure of BP variability into quartiles, the top quartile group was significantly lower total MoCA-J score (15.4 [95% confidence interval 14.2–16.7] vs. 17.9 [17.2–18.6]) and its domains, visuospatial-executive (2.2 [1.9–2.6] vs. 2.8 [2.6–2.9]), abstraction (1.0 [0.7–1.2] vs. 1.3 [1.1–1.4]), attention (2.8 [2.4–3.1] vs. 3.6 [3.4–3.8]), and naming (2.1 [1.9–2.3] vs. 2.5 [2.4–2.6]) than the group of other quartiles after adjusted by age and 24-hr SBP. These associations were not found in the quartiles of 24-hour SBP.

Conclusions: In elderly patients with strict ambulatory BP control, higher BP variability, not average ambulatory BP level, was associated with cognitive decline.
Objective: To study the relationship of blood pressure variability (BPV) with parameters of vasomotor endothelial function and C-reactive protein (hsCRP) in patients with arterial hypertension (AH) combined with coronary artery disease (CAD).

Design and method: A total of 80 patients with AH degree II-III and CAD were examined. 24-hour monitoring of blood pressure, endothelial dependent vasodilatation (EDV) and endothelium independent vasodilatation (EIV), level of hsCRP were evaluated.

Results: In general, in the studied group of patients with BPV the statistical indicators did not exceed however, the selection of patients with increased BPV showed that they constitute almost half of the observed sample (48.7%). Patients with increased BPV differed from patients with normal BPV by higher values of hsCRP (2.98 ± 0.71 vs 1.56 ± 0.33 mg/l, respectively), body mass index (33.91 ± 1.61 vs 29.49 ± 1.05 kg/m²), less pronounced response to the introduction of nitroglycerin in the evaluation EIV (13.21 ± 1.79 vs 17.70 ± 0.77%, p < 0.05). Correlations identified the relationship between systolic BPV day and EDV (r = -0.44, p = 0.012); hsCRP (r = -0.31, p = 0.008); systolic BPV night and EIV (r = -0.50, p = 0.003); diastolic BPV and EIV (r = -0.43, p = 0.013). The logistic regression analysis revealed that patients with depletion of EIV were 1.2 times more likely to have increased BPV OR 1.223 [95% CI 1.012–1.478; p = 0.037]. In patients with increased systolic BPV higher levels of hsCRP were observed 1.6 times more frequently OR 1.576 [95% CI 1.014–2.451; p = 0.043].

Conclusions: Relation of BPV with indicators of vasomotor endothelial function and a marker of the inflammatory response of the vascular wall that could indicate a pathodynamic relationship of the parameters, which, in turn, determine the development of adverse events in patients with AH and CAD was detected.

PP.16.15 VISIT-TO-VISIT BLOOD PRESSURE VARIABILITY IN PATIENT WITH HYPERTENSION AND STROKE

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Objective: High blood pressure variability is associated with high risk of stroke in hypertensive patients. Long time variability may be additional parameters of the blood pressure control. The aim of the study was to elucidate clinical significance of visit-to-visit blood pressure variability in patients with essential hypertension and stroke.

Design and method: 85 patients (34 men and 51 woman) with essential hypertension included into the study. Mean age was 64.9 ± 9.46 years. Patients was distributed into 3 groups: 31 patients with hypertension without any complications and target organ damage, 34 patients with hypertension and chronic kidney disease (CKD) and 20 patients with history of stroke. Groups did not differ significantly. The participants had their office BP measured during the 12-month follow-up. Blood pressure variability calculation was performed per data of electronic ambulatory cards. We defined systolic and diastolic visit-to-visit variability of BP using three metrics: coefficient of variation, standard deviation of the mean SBP, and average real variability.

Results: 84% of patients achieved blood pressure goal according office blood pressure measurement. Calcium antagonists and angiotensin receptor blockers often prescribed for patients after stroke. Achieved blood pressure was 127.7 ± 1.5/77.4 ± 1.03 mm Hg in patients with uncomplicated hypertension, 132.15 ± 2.5/77.58 ± 1.98 mm Hg in patients with stroke and 136 ± 1.06/83.9 ± 0.986 mm Hg in patients with CKD. Systolic blood pressure variability was higher in patients with stroke (9.9 ± 1.28 mm Hg) and CKD (10.9 ± 1.34 mm Hg) compare with patients without complications (6.47 ± 0.788 mm Hg, p < 0.05). In patients preserving beta-blockers-systolic and diastolic visit-to-visit blood pressure variability were significantly higher than in patients who did not got this medication (14.4 ± 2.43 mm Hg vs 7.5 ± 1.78 mm Hg for systolic and 8.98 ± 1.992 vs 6.74 ± 2.238 mm Hg for diastolic, p < 0.05). Systolic blood pressure variability was lower in patients preserving ACE inhibitors and calcium antagonists.

Conclusions: In patients with hypertension visit-to-visit blood pressure variability may be important therapeutic surrogate end-point, particularly in patients with stroke or have end-organ damage.

PP.16.16 REGULAR BENZODIAZEPINES CONSUMPTION ASSOCIATED WITH LOWER BLOOD PRESSURE IN AMBULATORY BLOOD PRESSURE MONITORING

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Objective: To investigate the impact of regular use of benzodiazepines on blood pressure variability measured by ambulatory blood pressure monitoring.
Objective: It has been previously demonstrated that benzodiazepines can help reduce acute elevation of blood pressure in hypertensive patients. However, the effect of regular benzodiazepine use on blood pressure has not been documented. In the current study, we aimed to evaluate whether benzodiazepine use (for at least 3 months) can be associated to the results of ambulatory blood pressure monitoring (ABPM).

Design and method: A retrospective analysis of the ABPM database between 2009 and 2015 was performed. The study groups were divided according to benzodiazepine treatment at least 3 months before an ABPM. Multivariate analysis using Generalized estimating equation (GEE) linear model was conducted to estimate the association between benzodiazepine treatment and ABPM test measurements: 24-h, daytime, and nighttime systolic and diastolic blood pressure.

Results: A total of 5020 ABPM studies were included in final analysis, including 713 ABPM of benzodiazepine-treated patients, and 4307 of untreated patients. The benzodiazepine-treated group was significantly older, with a predominance of female patients, comprised more diabetic patients and patients who consumed more antihypertensive medications. After adjustment for age, gender, diabetes mellitus, and number of antihypertensive medications taken, benzodiazepine treatment was independently associated with significantly lower systolic blood pressure over 24-h, during the daytime, and during the night [-2.176mmHg (-3.377; -0.974); -2.040mmHg (-3.268; -0.812) and -2.11mmHg (-3.486; -0.733)] respectively as well as with significantly lower diastolic blood pressure over 24-h, during the daytime and during the night [-1.802mmHg (-2.558; -1.047); -1.72mmHg (-2.502; -0.939), and -1.788mmHg (-2.610; -0.966)] respectively. Analysis stratified by age of 60 revealed that benzodiazepine consumption was associated with lower ABPM measurements only in the elderly group.

Conclusions: Use of benzodiazepines was independently associated with lower diastolic and systolic blood pressure in all parameters of ABPM in patients 60 years old and older, while not among younger patients.

Objective: It is well known that non-dipping pattern, nocturnal hypertension and isolated nocturnal hypertension are associated with target organ damage development and cardiovascular morbidity and mortality in hypertensive patients. Aim of our study was to investigate the reproducibility of MBPS in normotensive subjects and essential hypertensive subjects.

Design and method: A total of 68 consecutive never treated individuals referred for evaluation at the Hypertension Unit of our department, underwent 24-h ambulatory blood pressure (BP) monitoring at baseline and 1 month. Subjects with 24-h BP values > = 130/80mmHg were defined as hypertensives, whereas those with 24-h BP < 130/85mmHg as normotensives. The degree of nocturnal BP change (percentage) was calculated as [100BP (daytime BP)/BP (24h)] for both systolic and diastolic BP. Dippers were defined as subjects with nocturnal BP fall > 10% and non-dippers as patients with nocturnal BP fall ≤ 10%. Isolated nocturnal hypertension Statistical analysis was performed by means of reliability analysis (intraclass correlation coefficient (ICC)) for continuous variables and kappa agreement coefficient for categorical variables.

Results: Our study population consisted of 22 normotensives (32%) and 46 hypertensive (68%) subjects. In normotensive subjects the ICC for sleep-trough surge was 0.559 (p = 0.032) and for prewaking surge was 0.655 (p = 0.008). In hypertensive patients the ICCs for sleep-trough and prewaking surge were 0.331 (p = 0.089) and 0.164 (p = 0.273), respectively. When MBPS was dichotomized in low MBPS group and high MBPS group the kappa agreement coefficient for sleep-trough surge was 0.455 (p = 0.033) and for prewaking surge was 0.273 (p = 0.201) in normotensive subjects. In hypertensive patients the kappa agreement coefficient for sleep-trough surge was 0.217 (p = 0.140) and for prewaking surge was 0.043 (p = 0.768).

Conclusions: MBPS, by both definitions, is a reproducible phenomenon in normotensive subjects; however, the reproducibility of MBPS in hypertensive patients is very limited.
Results: A total of 270 subjects [34.2% males, mean (SD) age: 38.9 years] were evaluated and the prevalence of hypertension was 28.5%. Mean (SD) clinic BP was 121(15)/76(10) mmHg and home BP was 120(14)/75(10) mmHg. The awareness, treatment, control, and control among treated patients were 65.5, 54.5, 40, and 56.7%, respectively. Older age, male gender, obesity, and increased waist circumference were identified as risk factors for hypertension. Elderly men with family history of hypertension and premature CV diseases had better awareness and treatment. Based on clinic and home BP, normotension, sustained hypertension, white-coat and masked hypertension was presented in 73, 8.5, 8.5 and 10%, respectively.

Conclusions: The levels of awareness, treatment, and control needs more aggressive strategies should thus be adopted. A HBPM is an important tool to refine the diagnosis of hypertension, as home BP changed the diagnosis of hypertension in 18.5% of the subjects evaluated.

HEART RATE VARIABILITY IN PATIENTS WITH RESISTANTS WITH ARTERIAL HYPERTENSION
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Objective: Study heart rate variability (HRV) as an indicator on the development of complications of arterial hypertension (HT). It is proven that the increase in heart rate (HR) is associated with both the level of blood pressure and the degree of activity of the autonomic nervous system, and requires improvement.

Design and method: 42 patients with hypertension were divided into 2 groups: 1 group comprising 20 patients (average age: 51.4 ± 2.6 years) with resistant hypertension, and 1 group comprising 22 patients (average age 45.3 ± 3.7 years) with controlled hypertension disease. They had 14.4 ± 2.1 year-long history of hypertension. All these patients were subject to physical examination, biochemical investigation for cortisol, aldosterone-renin ratio, metalloprotein in urine, echocardiography, doppler echocardiography, ultrasound investigation of the kidneys and adrenal glands, 24-hour blood pressure monitoring, 24-hour ECG monitoring, conducted with the account of heart rate variability (HRV).

Results: HRV is determined by the impact of autonomic nervous system on heart. In I group, lack of blood pressure lowering (type non-responders) was registered in 50% of patients, while 22.7% of the patients had higher blood pressure at night than during the day (type night-peakers). In I group, 50% of patients had reduced SDANN rate (less than 100 ms). Their SDNN indexes correlated with the thickness of LV real wall (r = 0.65; P < 0.05), LV interventricular septum thickness (r = 0.65; P < 0.05), the LVMi (r = 0.66; P < 0.05) and the RMSSD rates, respectively. In patients of I group, the reduced SDANN and RMSSD rates indicated the reduced HRV and correlated with higher systolic blood pressure, contributing to hypotrophy of LV, and was accompanied by the deterioration of LV diastolic function, increasing the content of aldosterone and metalloprotein in daily urine (P < 0.05), compared to patients in group 2.

Conclusions: we found that in I group patients, the peculiar type of BP characteristic (non-dipper), the concentric left ventricular hypertrophy (CLVH), the increased functional activity of the sympathetic division of the autonomic nervous system, the content of aldosterone in blood and the content of metalloproteins in daily urine indicate that activation of neurohormonal systems is essential for the formation of resistance to drug therapy.

HOME BLOOD PRESSURE MONITORING SURVEY OF CHINA (HBPM-C): A PRELIMINARY REPORT
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Objective: To investigate the use of home blood pressure monitoring (HBPM) in Chinese hypertensives in cities.

Design and method: We designed and delivered 2040 questionnaires in 23 outpatient clinics of 12 community-based hospitals in Beijing and other cities from 5/2013-8/2013 for the survey. The questionnaires included basic demographic information, history of hypertension and complications, owning rate and kind of HBPM devices and questions on awareness and behavior model on HBPM, involving the upper limit value of systolic and diastolic pressure, time, frequency and methods of measuring.

Results: 1992 hypertensive subjects complete questionnaires (response rate is 99.2/2040). 50.3% were from central hospital, 41.2% were from community-based hospital, 48.6% were male. Nearly one third subjects accompanied with other cardiovascular risk factors, including smoking, alcohol use, higher salt intake, irregular exercise, cardiovascular disease (CVD) family history, indicating the urgent need of life style changes in China. More than 20% subjects complicated with CVD or diabetes. About 85% subjects have HBPM device and received the advice for HBPM as referring to a doctor, respectively. 10% subjects gave an accurate answer on the cut point of SBP (< 135 mmHg) or DBP (< 85 mmHg) of HBPM. Nearly 50% consider < 140/90 mmHg as the normal value for HBPM. As for the frequency of HBPM, 30% measure everyday and about 7% subjects never used HBPM despite the device was available. One third subjects used arm HBPM device and less than 18% were wrist style. More than one fourth subjects use HBPM only as having a symptom or uncomfortable. The others varied from raise up, on bed or morning. One third measured only once each time, more than one half subjects never record the readings of HBPM, and about 40% subjects never showed the readings of HBPM to the referral doctors.

Conclusions: Despite the high availability of HBPM devices in Chinese family in cities, the awareness and utilizing rate of HBPM are still low in China, indicating a compelling need for education and training on BP measurement and monitoring in Chinese subjects with hypertension.
occurrence. The BP values were defined as the means of the three BP readings in each occasion. Brachial-ankle pulse wave velocity (baPWV) and maximum carotid intima-media thickness (max-IMT) are also evaluated at the time of the study entry.

Results: In all subjects, we performed mixed model analysis for HSBP. The in-door temperature was negatively associated with HSBP (Estimates: -0.98, Standard error: 0.08, p < 0.001) even after adjusting for age, sex, BMI, clinic SBP, current smoking, current drinking, and the time of bathing/week (Table). In each subject, we calculated the correlation coefficient for in-door temperature and HSBP, and 67 subjects (30.1%) showed significant negative correlation [thermosensitive group (TS)]. In the TS group, the presence of COPD (p < 0.05) and max-IMT tended to be higher (p = 0.05) than the others. However, there was no significant difference in baPWV between the groups. Then we performed multivariable logistic regression analysis for the top 25 percentile [Quartile (Q) 4 vs Q1 – Q3] of the correlation coefficient between in-door temperature and HSBP as the dependent variable. As a result, those with higher max-IMT tended to be associated with Q4 (Odds ratio: 2.00, 95% CI, 0.96 – 3.92, p = 0.067).

Conclusions: In-door temperature was significantly associated with HSBP, and this association was strong in COPD and those with higher max-IMT. Thus, those phenotypes of hypertensives may be ‘thermosensitive hypertension’. Cold temperature would be a trigger for cardiovascular events in those subjects.

Linear mixed model analysis for home systolic BP

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Estimates</th>
<th>Standard error</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>0.05</td>
<td>0.07</td>
<td>0.52</td>
</tr>
<tr>
<td>Sex (male=1, female=0)</td>
<td>-2.30</td>
<td>1.40</td>
<td>0.00</td>
</tr>
<tr>
<td>Body mass index, kg/m²</td>
<td>-0.12</td>
<td>0.20</td>
<td>0.54</td>
</tr>
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<td>Clinic systolic BP, mmHg</td>
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<tr>
<td>Current smoking (yes=1, no=0)</td>
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<td>0.78</td>
<td>0.85</td>
</tr>
<tr>
<td>Current drinking (yes=1, no=0)</td>
<td>0.90</td>
<td>0.34</td>
<td>0.51</td>
</tr>
<tr>
<td>Bathing, times/week</td>
<td>-0.09</td>
<td>0.48</td>
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</tr>
<tr>
<td>In-door temperature, °C</td>
<td>-0.98</td>
<td>0.08</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

PP.16.31 BLOOD PRESSURE PROFILE IN PATIENTS WITH ARRHYTHMIAS

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Objective: Arterial hypertension is still a major risk factor for various cardiovascular diseases. Arrhythmias are common findings in hypertensive patients. Left ventricle hypertrophy and diastolic dysfunction, left atrial enlargement and abnormal function, have all been suggested as the underlying risk factors for supra-ventricular and ventricular arrhythmias in hypertensive subjects. The aim of this study was to evaluate the relationships between blood pressure profile and the incidence of ventricular and supra-ventricular arrhythmias in patients with known HTA and affirmative palpitations.

Design and method: 76 hypertensive patients, who were admitted in our department between January 2016 and December 2016 and presented with palpitations, were included in the study. Electrocardiogram and blood pressure monitoring was performed using EC-3/ABP Labtech device. Data were processed using Stata 12.

Results: Mean age 62.4 ±13.42 years. There was no significant difference between mean of the maximum systolic blood pressure in patients with dipper, non-dipper and reverse dipper profile (p = 0.5). A weak negative correlation between the number of ventricular (r = -0.16) and supra-ventricular ectopic beats (r = -0.22) and diastolic index. There was no significant difference between the number of supra-ventricular and ventricular arrhythmias in patients with dipper, non-dipper and reverse dipper profile (p = 0.57).

Conclusions: There is no clear evidence of increased supra-ventricular or ventricular arrhythmias incidence in reverse-dipper patients compared with dipper profile subjects. Paroxystic atrial fibrillation was observed in a small a percentage of cases.
the daughter (5) 11:00 they call ambulance, BP peaks at 175/115 (6) 11:45 paramedics arrive, BP decreases to 145/100 and it remains stable afterwards at 150/100.

Conclusions: The patient is stage 2 hypertensive, with normal dipping pattern during the sleep period. During stressful conditions the blood pressure climbed and plateaued at 175/115 mmHg with no further increases.

PP.16.33 COMPARISON OF SEASONAL CHANGES OF THE MAIN AMBULATORY BLOOD PRESSURE PARAMETERS IN TWO RUSSIAN REGIONS

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Objective: The seasonal changes of ambulatory blood pressure (ABP) in hypertensive patients became the subject of many studies during the past decade. The exploration of this problem in Russia deserves particular interest due to multiplicity of climate conditions across different regions. The aim of the study was to assess the particular qualities of seasonal blood pressure variability in two sites of the Russian Federation – Ivanovo (relative “north”) and Saratov (relative “south”).

Design and method: We included patients from the general population who visited ambulatory clinics for various reasons. The main inclusion criterion was office BP 130/85–139/89 mm Hg or long-term antihypertensive therapy. All participants provided written informed consent. The ambulatory blood pressure monitoring (ABPM) was performed with the BPLab device (Nizhny Novgorod, Russia) twice in each patient: in winter (December-February 2012–2014) and in summer (June-August 2012–2014). The interval between ABPMs was 6 months ± 7 days. The selection criteria for ABPM recordings were: duration >23.5 hours, absence of data gaps >1 hour, >55 readings per 24 hours. We analyzed the factors associated with abnormal levels of the main ABP variables in the whole sample. The stepwise multivariate logistic regression model was used to select the most valuable factors. This selection was preliminarily done for the subsets of variables. The analysis was adjusted for age and sex.

Results: 1,766 patients were enrolled, and 770 of them completed both visits - 499 from Ivanovo (mean age 52 ± 18 years, 181 men), and 271 from Saratov an (mean age 58 ± 11 years, 151 men). Table. Main results of the logistic regression analysis in patients who completed the study. SBP - systolic BP; DBP - diastolic BP; d - daytime; n - night; 24 - 24 hours.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Predictor of the abnormal level of</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>ABP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SBP24</td>
<td>Ivanovo residence</td>
<td>0.160</td>
<td>4.46</td>
<td>0.034</td>
</tr>
<tr>
<td>SBPn</td>
<td>Summer</td>
<td>0.402</td>
<td>14.52</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>DBP24</td>
<td>Winter</td>
<td>0.287</td>
<td>7.63</td>
<td>0.006</td>
</tr>
<tr>
<td>DBPd</td>
<td>Ivanovo residence</td>
<td>0.400</td>
<td>18.40</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>DBPd</td>
<td>Winter</td>
<td>0.400</td>
<td>13.74</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>DBPn</td>
<td>Saratov residence</td>
<td>0.435</td>
<td>12.80</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ABP Fall (&lt;10%)</td>
<td>Saratov residence</td>
<td>0.587</td>
<td>24.55</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ABP Fall (&lt;15%)</td>
<td>Saratov residence</td>
<td>0.101</td>
<td>74.46</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Conclusions: The higher 24-hour and daytime BP levels in winter and in Ivanovo could reflect insufficient BP control in the cohort with a tendency to masked hypertension. The nocturnal hypertension and non-dipper tendency were more typical for Saratov residents and may be explained by relatively hot summers and poor sleep quality.

PP.16.34 EFFECT OF SELF-MEASUREMENT OF BLOOD PRESSURE ON HEMODYNAMICS – THE ANSIA STUDY

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Objective: Blood pressure (BP) variability and anxiety responses may influence BP measurement. We recently showed that ~20% of patients referred for out-of-office BP measurement have a significantly higher home compared to ambulatory BP and, in addition, a large difference between office and ambulatory BP indicative of a white coat effect. We hypothesized that these patients may have an anxiety response upon the self-measurement of BP or ‘auto-cuff’ response. The objective of the study was to evaluate BP responses during self-BP measurement.

Design and method: We included 50 subjects, 25 (mean age 66.3 ± 10.9 years, 37.5% female) with and 25 (mean age 57.6 ± 10.2 years, 48.0% female) without a previously established difference between home and ambulatory BP = >10/5 mmHg. All subjects performed 10 consecutive measurements after at least 10 minutes rest followed by another resting period of 10 minutes, while receiving continuous non-invasive monitoring of BP and central hemodynamics. At the end of the self-measurements recording was continued to complete the 30-minute period. Mean BP of the 60 seconds before the start of the self-measurements was used as baseline and compared with the first 10 seconds after the beginning of each self-measurement.

Results: We observed a significant increase in BP during self-measurement compared to baseline, which was greater in subjects with a large difference between home and ambulatory BP (135.0 ± 23.6/74.1 ± 14.2 vs 141.0 ± 26.1/78.2 ± 12.7 mmHg, p = 0.001) compared to those without (134.5 ± 20.3/77.4 ± 10.9 vs 138.9 ± 25.0/80.0 ± 12.7 mmHg, p = 0.028/0.019). The increase in BP was accompanied by an increase in cardiac output (5.2 ± 1.5 vs 5.4 ± 1.5 lpm, p = 0.018 and 5.4 ± 1.5 vs 5.6 ± 1.5 lpm, p = 0.019, respectively) and heart rate (67.0 ± 14.5 vs 71.0 ± 14.9 bpm, p = 0.005 and 71.0 ± 13.2 vs 74.3 ± 13.4 bpm, p < 0.001). No attenuation could be observed in BP responses between the first three and the last three self-measurements.

Conclusions: Our results support the existence of an ‘auto-cuff’ response during self-BP measurement. BP responses did not attenuate during repeated measurements. In addition, anticipation of self-BP measurement appears to contribute to the increase in BP.

PP.16.35 AUTOMATED OFFICE BLOOD PRESSURE IN STABLE HYPERTENSIVE PATIENTS: RESULTS OF A MULTICENTRE STUDY

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Objective: Automated office blood pressure (AOBP), measured in the absence of health care professionals, may eliminate white-coat effect. In the SPRINT study, blood pressure was measured with this method, and therefore, it is important to study its relationships to manually measured office blood pressure (OBP) which is crucial for clinical decision making as it was used in the vast majority of other prospective studies in hypertension.

Design and method: Stable treated hypertensive subjects were included in this study which was performed in six Czech hypertension centres. AOBP was measured with the BPT device (six measurements, average of 2nd to 6th measurement is considered); after AOBP, blood pressure (BP) was measured six times in the office (three times with auscultatory method by the physician followed by three oscilometric measurements). 24-hour ambulatory BP monitoring (ABPM) was performed within one week from the clinical visit.

Results: Data on 191 subjects aged 64 ± 12 years with OBP 127.3 ± 12.2/77.5 ± 10.0 mm Hg are reported. AOBP was by 9.6 ± 19.2 mm Hg lower than OBP and by 4.3/0.5 mm Hg higher than AOBP; the correlation coefficient of 24-hour mean BP with OBP and with AOBP did not differ (R² for difference >0.10).

Conclusions: AOBP gives comparable results in different clinical centres and thus, it can be introduced in clinical practice as a supplementary method to classic OBP. AOBP values are systematically lower than classic OBP and this phenomenon may partly explain the SPRINT results. Interindividual variability of the AOBP-OBP difference is large. The prediction of ABPM by AOBP is not better than by OBP.
POSTER SESSION PS17: KIDNEY AND RAAS

**PP.17.01** ACTIVATION OF RENIN-ANGIOTENSIN SYSTEM STIMULATES THE ORGANIC CATION TRANSPORTER 2 AND INCREASES CISPLATIN TOXICITY

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Objective: The intrarenal RAS is characterized by high levels of angiotensin II (Ang II) and wide distribution of angiotensin receptors (ATR). There is indirect data showing cross-talk between the RAS and the human organic cation transporter 2 (hOCT2). This transporter is highly expressed in the basolateral membrane of proximal tubules cells and plays an important role for uptake, accumulation, and toxicity of cisplatin. Therefore, we aimed to investigate whether Ang II is able to modulate cisplatin toxicity in Madin-Darby canine kidney (MDCK) cells.

Design and method: The uptake of the fluorescent organic cation 4-(4-(dimethylamino)styryl)-N-methylpyridinium iodide (ASP+, 20 mM) added to the basolateral compartment of MDCK cells stably expressing hOCT2 growing on filters was measured in the presence of 1 nM Ang II alone or with the AT1R blocker losartan. Following 1 hr incubation at 37°C, cells were solubilized and the intracellular ASP+ concentration was measured with a microfluorimeter. Next, cell monolayers were incubated with 0.1 mM cisplatin alone or with 1 nM Ang II and blocker combinations. During and after incubation with different solutions trans-epithelial electrical resistance (TEER) and cell viability of MDCK cell monolayers was evaluated. All values are given as mean ± SEM.

Results: Incubation with 1 nM Ang II significantly stimulated the hOCT2 mediated ASP+ uptake. ASP+ concentration in lysates of control and Ang II stimulated cells: 1.8 ± 0.4 and 2.2 ± 0.2 mmol/L protein, n = 7–13, respectively. This effect was abolished under 1 mM losartan. Following 1 hr incubation at 37°C, cells were solubilized and the intracellular ASP+ concentration was measured with a microfluorimeter. Next, cell monolayers were incubated with 0.1 mM cisplatin alone or with 1 nM Ang II and blocker combinations. During and after incubation with different solutions trans-epithelial electrical resistance (TEER) and cell viability of MDCK cell monolayers was evaluated. All values are given as mean ± SEM.

Conclusions: We propose that in MDCK cell system Ang II augments cisplatin toxicity and that this effect is related to stimulated hOCT2 function.

**PP.17.02** THE EFFECT OF INTENSIVE LIPID LOWERING VERSUS USUAL LIPID LOWERING ON RENAL FUNCTION IN PATIENTS WITH ATHEROSCLEROTIC RENAL ARTERY STENOSIS UNDERGOING RENAL ARTERY STENTING

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Objective: To investigate how intensive lipid lowering affects renal function when compared with standard lipid lowering in patients with atherosclerotic renal artery stenosis undergoing renal artery stenting.

Design and method: Between June 2013 and December 2014, a total of 150 patients with atherosclerotic renal artery stenosis undergoing renal artery stenting were randomly (1:1) assigned to receive intensive lipid lowering [the goal of low density lipoprotein cholesterol, LDL-C < 1.8 mmol/L] or usual lipid lowering (the goal of LDL-C 1.8–3.3 mmol/L). All patients received rosuvastatin. LDL-C was adjusted to the goal within two months and appropriate treatment was maintained. No significant difference existed in the treatment regimens other than lipid-lowering therapy between the two groups. The primary end points were estimated glomerular filtration rate (eGFR) and urinary albumin to creatinine ratio at 6 months. The secondary end points were the number of antihypertensive medications, the clinic blood pressure, the restenosis rate, cardiovascular clinical events at 6 months.

Results: The baseline clinical characteristics were comparable between two groups. At 6 month follow-up, LDL-C was lower in the patients with intensive lipid lowering than with usual lipid lowering [1.51 ± 0.32 vs 2.32 ± 0.47 mmol/L, P < 0.01] eGFR [92.0 ± 29.3 vs 79.5 ± 19.4 mL/(min/1.73 m²), P < 0.01] and the increase of eGFR [16.7 ± 3.6–24.6 vs 1.5 ± 9.5–8.7 mL/(min/1.73 m²), P < 0.01] were higher in the patients with intensive lipid lowering than with usual lipid lowering; urinary albumin-creatinine ratio [45.3 (19.8–64.0) vs 55.4 (26.0–121.8) mg/g, P = 0.037] was lower and the decrease of urinary albumin-creatinine ratio was higher [31.7 (2.3–54.4) vs 6.6 ± (17.6–31.1) mg/g, P < 0.01] in the patients with intensive lipid lowering than with usual lipid lowering. In term of secondary end points, the number of antihypertensive medications and the clinic blood pressure decreased in both the two groups. But there was no significant difference between the two groups. The restenosis rate and major clinical events were similar between two groups.

Conclusions: In patients with atherosclerotic renal artery stenosis undergoing renal artery stenting, renal function is improved greater in the intensive lipid lowering group than in the usual lipid lowering group.

**PP.17.03** EGFRS FROM ASIAN AND CHINESE MODIFIED CKD-EPI EQUATIONS WERE ASSOCIATED BETTER WITH TARGET ORGAN DAMAGES IN COMMUNITY-DWELLING CHINESE ELDERLY: THE NORTHERN SHANGHAI STUDY

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Objective: In literature, many equations exist in assessing patients’ eGFR, but those equations were mainly derived and validated in the population from the western countries. Therefore, the efficacy of those equations in the Chinese population remains unclear, as well as their comparison. Since the eGFR decline is a frequent manifestation in elderly and is strongly associated with other target organ damages (TODs), we aimed to investigate whether the recent eGFRs equations derived from Asian and Chinese are better associated with TODs than other equations in the Chinese elderly.

Design and method: 1599 community-dwelling elderly subjects (age >65 years) in northern Shanghai were recruited from June 2014 to August 2015. Hypertensive TODs were assessed for each participant, including left ventricular mass index, carotid-femoral pulse wave velocity, carotid intima-media thickness (IMT), ankle-brachial index and urine albumin to creatinine ratio. Participants’ eGFRs were calculated from the MDRD, CKD-EPI, Chinese abbreviated MDRD, Asian modified CKD-EPI (aCKD-EPI) equation and Chinese modified CKD-EPI (cCKD-EPI) equation, respectively.

Results: In multivariate regression analysis, only eGFRs from aCKD-EPI and cCKD-EPI equations were significantly and inversely associated with carotid IMT (p = 0.004 and p = 0.049, respectively). In logistic models, after confounders were adjusted, decreased eGFR from all the equations were significantly associated with lower ABI (p < 0.001), micro-albuminuria (p < 0.001) and increased PPW (p < 0.001). Only decreased eGFRs from aCKD-EPI and cCKD-EPI equations were significantly associated with increased IMT (both crude p < 0.05). In the ROC analysis, only aCKD-EPI and cCKD-EPI equations presented significant associations with all the listed hypertensive TODs (p value from p < 0.05 to p < 0.001).

Conclusions: In the Chinese elderly, eGFRs from aCKD-EPI or cCKD-EPI equations are better associated with hypertensive TODs, as compared with other eGFR equations.
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Objective: Several factors contribute to the development of hypertension in patients with IgA nephropathy (iGA). This study was conducted to find the relationships between baseline blood pressure and clinico-pathological findings in patients with iGA and normal renal function.

Design and method: Clinico-pathological findings were analyzed in a total of 163 patients with iGA and normal serum creatinine levels from the Kyung-Hee Cohort of Glomerulonephritis.

The glomerular surface area (GSA) was determined in the renal biopsy specimen using imaging analysis software. The serum and urine angiotensinogen (AGT) concentrations were measured using human ELISA kits.

Results: Systolic BP was >130 mmHg in 72 patients (44%) and >140 mmHg in 42 (26%). Systolic BP was positively correlated with age, serum uric acid concentrations, IgM deposit and baseline and follow-up proteinuria, and negatively with follow-up glomerular filtration rate and the slope of change in 1/serum creatinine for 2 years, while it has no significant relationships with serum and urine AGT and 24 hour urinary sodium excretion.

Patients with systolic BP >130 mmHg as compared with those <130 mmHg showed higher GSA, severer degree of interstitial fibrosis, larger amount of proteinuria after follow-up, and higher serum creatinine and lower glomerular filtration rate after follow-up.

Conclusions: Baseline systolic BP was associated with renal progression and severe pathological findings, glomerulomegaly and interstitial fibrosis, in patients with iGA.
Conclusions: Kidney and cardiovascular damage after standardized 5/6 Nx was more pronounced in 129/Sv than in C57BL/6 mice. This study suggests that the use of this model in 129/Sv mice is relevant to study the cardiovascular consequences of CKD, while an increased severity of the experimental model may be required in C57BL/6 mice.

Renal Hyperfiltration is Associated with Higher Central Blood Pressures in Healthy Individuals

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Objective: Renal hyperfiltration has been shown to be associated with mortality and cardiovascular issues, however the mechanisms explaining this association remain unknown. We propose that an augmentation of the central pulse pressure lead to renal hyperfiltration. This study aims to show the relationship between these two parameters in a group of healthy individuals.

Design and method: Of the 20,004 participants in the CARTaGENE cohort, 10,075 healthy individuals (without high blood pressure, diabetes nor cardiovascular comorbidities) had central pressure measurements. From these participants, a group of « hyperfiltrators », defined as an estimated glomerular filtration rate (eGFR) higher than the 95th percentile after stratification for sex and age was compared to a control group, defined as the participants with an eGFR between the 25th and 75th percentiles. The central blood pressures adjusted for known confounding factors and peripheral blood pressure were than compared between the two groups through general linear modelling.

Results: Table 1 shows different baseline characteristics between the hyperfiltrators [median eGFR 110.6 (IQR 105.8, 114.1) ml/min/1.73m2] and the control group (median eGFR 91.0 (IQR 85.9, 96.7) ml/min/1.73m2). After adjustments, central systolic blood pressure and central pulse pressure were significantly higher in presence of renal hyperfiltration (Table 2).

Conclusions: There is no systematic increase in creatinine levels in benign essential hypertensives. Around 10% of patients showed a creatinine increase of at least 20 micromoles during follow up but this increase was abrupt and not slowly progressive over time.

Long Term Variations of Creatinine in Essential Hypertensives


Objective: The way renal function may decline with time in benign essential hypertension is still a matter of debate. This evolution was studied in a prospective registry of essential hypertensive patients untreated at baseline and then treated with various antihypertensive treatments.

Design and method: Among a registry of 1200 essential hypertensives, we selected all patients with baseline normal renal function (eGFR MDRD> 60 ml/min/1.73m2), no diabetes and no proteinuria and with at least one other creatinine dosage available at least 10 years apart from baseline.

Results: 433 patients were thus selected (231 males, 202 females, aged 51 ± 11 years at inclusion with baseline creatinine = 83 ± 15 mmoles/l and eGFR = 82 ± 15).

Average follow up was 18 ± 5 years. Average creatinine change was not significant (0 ± 27). A creatinine level > 130 mmol/l was recorded in 12 patients (2.8%) with only one terminal renal failure and dialysis. 46 showed an increase in creatinine of at least 20 mmoles. In all cases but two this increase was abrupt from a dosage to another and not progressive along the whole survey. The figure illustrates the variation of creatinine levels in patients with a creatinine increase of at least 20 mmoles and at least 3 different creatinine measurements during follow up. A stepwise discriminant analysis showed that baseline office pulse pressure (PP) (p = 0.003), age (p = 0.001) and baseline eGFR (p < 0.001), but not PP at follow up or survey lasting were significant predictors of such an increase in creatinine level.

Correlation of Diagnosed Peripheral Artery Disease with an Abrupt Increase in Articular Blood Pressure Due to Sudden Renal Artery Stenosis in a Middle-aged Woman

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Objective: - to establish peripheral artery disease as prognostic marker for renal artery disease.
- to relate the sudden onset of hypertension to rapid evolving renal artery stenosis in young patients with limited peripheral artery disease.
- to illustrate the necessity of secondary hypertension diagnostic workup in young patients with limited peripheral vascular disease.

Design and method: A 49-year-old woman with acute occlusion of the distal left popliteal artery was admitted to the surgical clinic of our hospital and treated with intravenous anticoagulants and prostaglandins. On the third day of hospitalization, she presents with high blood pressure (200/100mmHg) and sinus tachycardia. Laboratory testing revealed normal renal function(electrolytes and urinary albumin excretion), normal lipid levels. Elevated factor VIII level was not assessed as a cause. At the moment. The rest of physical examination was normal. The diagnostic workup for secondary hypertension found a pathognomonic increase of renal activity with normal serum aldosterone level. The lower limb angiography showed complete occlusion of the left popliteal artery and partial obstruction of the right posterior tibial artery. A retroperitoneal CT angiography showed an atrophic left kidney and a narrowing of the left renal artery. The lower pole of the left kidney had normal transversal dimensions. This finding was attributed to the existence of a subsidiary artery supplying the renal parenchyma of the lower pole. The re-nogram showed a significant decrease in the left kidney perfusion by 70% DSA angiography followed, revealing an atrophic left kidney with diffuse stenosis of the thin left renal artery, without the possibility of safe intervention.

Results: Antihypertensive calcium channel blocker and beta-blocker were prescribed with a good outcome. The treatment of peripheral artery disease consisted of low molecular weight heparin and then oral anticoagulants with intravenous prostaglandins. After one year, the patient had a lower limb amputation, due to gangrene below the knee.

Conclusions: The peculiarity of the case is that atherosclerosis manifested by peripheral artery disease was followed by renovascular hypertension. The assessment of secondary hypertension is, therefore, advisable even in patients presenting with limited peripheral occlusion of the arterial network, especially in young patients.
Objective: Uremic malnutrition, also called, protein energy wasting (PEW), is a common problem in patients with end stage renal disease undergoing hemodialysis (HD). This syndrome has been associated with morbidity and mortality. N-terminal Pro Natriuretic Peptide (NT-proBNP) levels are established markers of cardiac dysfunction and have also been associated with cardiovascular event and all-cause mortality in HD patients. It was suggested that PEW might have a direct effect on the level of NT-proBNP by affecting ventricular remodeling. We aimed to evaluate the association between NT-proBNP and malnutrition in hemodialysis (HD) patients according to the International (ISRN) definition for PEW.

Design and method: To identify malnutrition, one component in each of the 4 categories of the wasting syndrome were retained: serum albumin less or equal to 38 g/L, BMI less or equal to 23 Kg/m², creatininemia less or equal to 818 nmol/L/m² and normalized protein catabolic rate less or equal to 0.8 g/kg/day. NT-proBNP was assessed using a chemiluminescence immunoassay, at the start of dialysis.

Results: In 207 patients (mean age: 64 years +/-13), the median (IQR) dialysis vintage 6.3 (2.8–10.4) years. Major comorbidities were hypertension (90%), diabetes (41.5%), PEW (at least three components) was found in 16.9% and 13.8% had a left ventricular ejection fraction (LVEF) lower than 60%. NT-ProBNP ranged from 125 to 33 144 pg/mL. Patients with high NT-ProBNP levels (less or equal to 6243 pg/mL) were more likely to have higher frequencies of the four factors of PEW and lower mean LVEF. Patients with PEW had higher mean NT-proBNP; (P = 0.002) and lower mean intradialytic weight gain (IDWG) (P < 0.001) than the others. High levels of NT-proBNP were associated with PEW (OR: 14.2, P < 0.001), gender (P = 0.022), CRP >5 mg/L (P = 0.007), LVEF (OR: 0.93; P = 0.011) but not with predialysis systolic blood pressure. NT-ProBNP concentrations was positively associated with the number of malnutrition factors and inversely with the IDWG (P < 0.001 for both).

Conclusions: In hemodialysis patients, high NT-proBNP levels must draw attention to cardiac function but also to nutritional status.
the relationship (HR = 1.426; 95% CI 1.06–1.92; P = 0.019). The impact of IL-6 on mortality decreased when adding cf-PWY (HR = 1.388; 95% CI 1.03–1.87; P = 0.032) in the previous model suggesting that the detrimental role of IL-6 on mortality may involve aortic stiffness.

Conclusions: This study reveals a positive relationship between IL-6, aortic stiffness and mortality in CKD patients. Our results, together with our previous findings in an experimental animal model, indicated that IL-6 may represent a novel therapeutic target of CKD-related-CVD.

**PP.17.21 ACUTE RENAL FAILURE SECONDARY TO RENIN ANGIOTENSIN SYSTEM BLOCKERS: SHORT AND LONG-TERM PROGNOSIS**

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Objective: Blockers of the renin angiotensin system (BSRA) are commonly used in hypertension, cardiovascular and renal diseases. However their use is associated with risks in pregnancy. As part of our study we reviewed the literature to determine the short and long-term prognosis of acute renal failure (ARI) secondary to BSRA.

**Design and method:** We retrospectively reviewed all patients suffering from ARI secondary to BSRA over a 20 year period. Long-term endpoints were defined as: short-term improvement of renal function (1 month) and long-term (2 years).

**Results:** We collected 116 cases of ARI secondary to BSRA therapy. The average age was 69±12 years with a sex ratio of 0.7. A history of hypertension, diabetes, heart failure and CKD was observed in 85.3%, 38.8%, 21.6% and 35.3%, respectively. An associated drug was noted 28.4%; anti inflammatory drugs (17.2%), anxiolytics (3.4%) and diuretics or contrast agents (7%). In the short term, the absence of improvement in renal function was observed in 19% of cases. Patients who did not improve their renal function were older (70±10 years versus 64±16 years) than those with improvement (p = 0.028). After discharge, 31% of these patients were lost to follow-up, 4.3% have aggravated their renal function and 12% reached the stage of CKD. Diabetes (p = 0.012), hypertension (p = 0.015), history of nephropathy (p = 0.001) and winter season (p = 0.002) are factors for poor long-term prognosis.

Conclusions: The ARI due to BSRA is associated with a high morbidity and mortality. Our study showed that advanced age is a factor of poor short term prognostic factors were hypertension, diabetes a history of nephropathy and the winter season. The ARI to BSRA represents an often avoidable event, the prognosis of which is usually better than that of ARI related to other etiologies.

**PP.17.24 THE RESPONSE OF PLASMA ALDOSTERONE TO SALINE INFUSION IS UNDER THE INFLUENCE OF AGE IN PRIMARY HYPERTENSION**

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Objective: In patients with primary hypertension, plasma aldosterone (PA) levels are significantly decreased by an intravenous saline load (IVSL), but this response is variable among patients and related to the ability of salt to modulate aldosterone production. Previous studies have reported that the activity of the renin-angiotensin-aldosterone system is related with age. The aim of this study was to investigate whether age might affect the aldosterone response to an IVSL.

**Design and method:** In 124 hypertensive patients (48 ± 13 y, 71 males) who were washed-out of antihypertensive drugs for 2 weeks, we measured renin and PA levels before and after an IVSL (2 l. saline in 4 h). In all patients secondary causes of hypertension were excluded. For statistical purposes patients were subdivided into two groups based on age (< or > 60 y).

**Results:** Twenty-three of 124 patients (18%) were < 60 y of age or more (range 61–77) and the remaining were younger than 60 y (19–60 y). No differences were found between the two groups for gender, body mass index, serum potassium and creatinine clearance. Urinary sodium excretion was compatible with patients younger than 18 y (<60 y) or older (159 ± 83) or younger (159 ± 83). Baseline PA (76 [49–121] pg/ml) and renin (5.0 [1.9–9.8] mcIU/ml) levels were significantly lower in patients older than 60 y than in those younger than 60 y (115 [77–162] pg/ml, P = 0.019; 10.7 [5.1–20.8] mcIU/ml, P = 0.026). As expected IVSL decreased significantly (P < 0.001) both plasma renin and aldosterone levels. Post IVSL renin was 3.0 [1.4–7.9] mcIU/ml in patients older than 60 y and 6.2 [3.0–12.5] mcIU/ml younger than 60 y. Following IVSL, PA decreased by 87% (10 [10–13] pg/ml) in patients older than 60 y and by 76% (28 [10–49] pg/ml; P = 0.003) in patients younger than 60 y. The change in PA induced by IVSL was significantly and inversely related to age (r = –0.185, P = 0.039).

Conclusions: PA levels are lower in hypertensive patients older than 60 y. This difference becomes more relevant after IVSL suggesting greater response of the rennin-angiotensin system to volume expansion. This should be taken into account in the diagnostic work-up of hypertensive patients.

**PP.17.25 BLOOD PRESSURE CHANGE DURING THE HEMODIALYSIS IN CHRONIC HEMODIALYSED PATIENTS IN RELATIONSHIP TO THE HYDRATION STATUS MEASURED CLINICALLY AND ALSO BY BIOMEDPERANCE SPECTROSCOPY**

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Objective: To assess blood pressure (BP) change in relation to hydration status measured clinically and by bioimpedance spectroscopy method (BIS) in chronic hemodialysed patients.

**Design and method:** A 10 months, one centre retrospective analysis was performed on the group of 48 regularly hemodialysed patients (M/W: 15/33) to analyse the BP change in relationship to hydration status measured clinically (weight, dry weight, intradialytic weight gain,) and by BIS: overhydration (OHI), extra-cellular water volume (ECW), total body water volume (TBW) and rates of ECW and ECW/TBW before and after the hemodialysis. Patients were divided...
into different regions based on their BP levels before hemodialysis and hydration status, which was measured by BIS. The relationship between BP and hydration status change was also evaluated.

Results: The significant change of systolic BP (p < 0.001; 95%CI 3.7–7.0 - p < 0.004, 95%CI 0.49–3.8) and diastolic BP (p < 0.001; 95%CI 1.0–7.0 - p < 0.0038; 95%CI 0.49–3.8) was identified in the first 3 hours of the hemodialysis, and also in the weight loss measured clinically (p < 0.001; r = 0.17) and to the hydration status assessed by BIS (p < 0.001; r = 0.19). The rate HO/ECW revealed a significant correlation to systolic BP (p ≥ 0.02; r = 0.10) and ECW/TBW to diastolic BP (p < 0.006; r = 0.12) before hemodialysis in comparison to the clinically measured hydration. 6% of patients were found to have both normal level of BP (>140mmHg) and overhydration (≥1.1). In 32% of analysed group reached range of BP <150mmHg and overhydration <2.5l. Volume dependent hypertension (BP > 150mmHg; HS >2,5l) was documented in 27%. The region of severe heart impairment represented 33% of our group.

Conclusions: It was identified that the amount of overhydration played an important role in one third of the analysed patient group. In addition, a decrease of blood pressure was observed in relation to the fluid removal. BIS hydration parameters seem to be more suitable predictors of blood pressure level before hemodialysis compared to the clinically measured hydration status.

Parameters of Arterial Stiffness and Central Pulse Wave are Associated with Valve Calcification in Patients with End-Stage Renal Disease on Hemodialysis


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Objective: Arterial stiffness is known marker of poor cardiovascular prognosis. Associations of valve calcification (VC) and arterial stiffness in patients with end-stage renal disease (ESRD) are not well studied. The aim if the study was to assess the incidence of VC in patients with ESRD and its associations with clinical parameters and markers of arterial stiffness.

Design and method: In 68 adults with ESRD on maintenance hemodialysis for >3 months (45.6% males, mean age 58.3 (interquartile range (IQR) 54.6–61.6) years, dialysis duration 62.7 (47.7–77) months., arterial hypertension 94%, heart failure 28%, diabetes mellitus 21%, glomerulonephritis 35%, pyelonephritis 25%, multicystic dysplastic kidney 13%, urolithiasis 10%) echocardiography and planimetry was performed. Calcification in mitral (MV), aortic (AVC) or both valves and parameters of arterial stiffness and central pulse wave were assessed. Mann-Whitney test was considered significant if p < 0.05.

Results: Calcification of the aortic, mitral and both valves was revealed in 46 (67.6%), 34 (50%) and 33 (48.5%) of patients. 20 (29%) patients had no signs of VC. Patients with vs without AVC were older (65 ± 9.5 vs 41 ± 13.9 years, p < 0.001), had higher dialysis duration (51 (8.25) vs 21 (10.38) months, p < 0.01), lower peripheral diastolic blood pressure (DBP) (76 ± 17 vs 84 ± 12 mmHg, p < 0.05), central DBP (75 ± 15 vs 82 ± 11 mmHg, p < 0.05), reflected wave transit time (WTTR) (131 ± 17 vs 137 ± 15 ms, p < 0.05). Patients with vs without MVC were older (67.8 ± 8.2 vs 47.9 ± 13.5 years, p < 0.001), had higher dialysis duration (51 (34.11) vs 36 (14.57) months, p < 0.01), carotid-femoral pulse wave velocity (10.1 ± 2.7 vs 8.9 ± 3.5 m/s, p < 0.05), lower peripheral DBP (73 ± 17 vs 84 ± 14 mmHg, p < 0.01), central DBP (72 ± 13 vs 83 ± 13 mmHg, p < 0.001), higher central pulse pressure (52 ± 13 vs 45 ± 16 mmHg, p < 0.05), lower WTTR (133 (120;130) vs 135 (132;142) ms, p < 0.05).

Conclusions: High prevalence of valve calcification (71%) was revealed in patients with ESRD on maintenance hemodialysis. Patients with vs without VC were older, had higher duration of dialysis and more pronounced arterial stiffness.

Predictors of Acute Kidney Injury in Patients with Acute Cardiac Diseases


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Objective: To identify predictors of different flow options AKI in patients with severe cardiovascular disease and to develop a risk assessment scale of AKI in patients with severe cardiovascular disease.

Design and method: The study included 987 people who were 3 groups: those with AD CHF (n = 278) and ACS with non-ST-elevation (n = 288), respectively, were hospitalized in Moscow Clinical Hospital ‘64’, in the third group consisted of patients with stable CHF (n = 421). Statistical analysis was performed using statistical software application package Statistica 10 and SPSS22.

Results: Risk of AKI determined primarily renal function and blood pressure levels, as well as in patients with existing comorbidities. Predictor of outpatient AKI, moreover, it was alcohol abuse (OR 2.31, 95% CI 1.4–3.81, p < 0.001), and for the hospital AKI - appointment of loop diuretics (OR 2.32, 95% CI 1.53–3.51, p < 0.001) and vasoconstrictor (OR 2.04, 95% CI 1.35–3.09, p < 0.001) in the hospital, age older than 80 years (OR 1.78, 95% CI 1.12–2.8 CI, p < 0.05). Predictors of persistence AKI had LVEF < 35% (OR 2.12, 95% CI 1.24–3.62, p < 0.001), as compared to its transitory nature - SBP at admission > 180 mmHg (OR 4.42, 95% CI 1.22–15.95, p < 0.05).

Conclusions: The most significant risk factors for ACS are signs of impaired renal function and low levels of SBP at admission, anemia, or AHF or AD CHF, alcohol, appointment vasoconstrictor and loop diuretics for the first time in the hospital, IHD, CKD, with type 2 diabetes. The specific predictors for patients with AD CHF are the absence of beta-blocker therapy in the outpatient phase, the high status of hydration and history of hospitalizations for heart failure decompensation during the last year, and for patients with ACS with non-ST-elevation - old age, hypoglycemia admission and development of MI in the outcome of ACS. For the first time the appointed combination of three drugs (ACE inhibitors, beta-blockers and loop diuretic) at admission increases the risk of hospital persistent AKI in patients with ACS with non-ST-elevation.

The Role of Biomarkers in Early Diagnostic of Acute Kidney Injury in Patients with Acute Cardiorenal Syndrome


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Objective: Explore the place biomarkers damage the heart and kidneys in the development of risk assessment, early detection and prediction of short-term outcomes of acute cardiorenal syndrome.

Design and method: On admission, 109 randomly selected patients using immunoassay ELISA analysis to determine the level of biomarkers AHF / AD CHF (NT-pro BNP in serum) and kidney damage (cystatin C in serum; NGAL, KIM-1 and IL-18 in the urine). Statistical analysis was performed using statistical software application package Statistica 10 and SPSS 22 using standard algorithms of variation statistics.

Results: We enrolled 109 subjects (mean age, 68.5; years; 62% men). We were examined biomarkers heart damage (NT-pro BNP and kidney (cystatin C in serum, NGAL, KIM-1 and IL-18 in the urine). Patients with AKI as compared with patients with stable renal function were detected higher levels of NGAL (p < 0.001) and KIM-1 (p < 0.01) in all groups, the differences of IL-18 levels in the urine and cystatin C in blood were higher in ACS without elevation ST than in patients with AD CHF (p < 0.001 and p < 0.01), NT-proBNP levels were higher in ACS without elevation ST (p < 0.001) in patients with AKI compared with patients with stable renal function and no difference in AD CHF group. For NGAL and KIM-1 have been identified in terms of separation method for determining the maximum sum of sensitivity and specificity (60.1 mg / ml and 0519 mg / ml), and calculated the sensitivity and specificity, which accounted for NGAL 87% and 92%, and for KIM-1 - 87% and 67%.

Conclusions: Patients with changes in serum creatinine by 10–50% from baseline did not differ from patients with AKI on major risk factors, hospital mortality in these patients is lower than in patients with AKI (30% and 12%, p < 0.05), but higher than in the group with stable renal function. Defining two structural renal damage markers (NGAL and KIM-1) in high-risk patients to diagnose AKI 95% cases. The most significant biomarkers for early diagnostic AKI in patients with ACS include neutrophil gelatinase-associated lipocalin (NGAL), a proinflammatory - IL-18, cystatin C and KIM-1

Renal Artery Dissection: Causes and Follow-Up of 61 Cases

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Objective: Renal infarction related to renal artery dissection (RAD) is a rare entity. The aim of this study is to analyze the clinical characteristics and dissection recurrence of patients with RAD.

Design and method: Between 2000 and 2015, 91 consecutive patients with renal infarction related to RAD were retrospectively identified in our Unit. Clinical and biological characteristics were extracted from our clinical data warehouse. Renal imaging was reviewed by two readers unaware of the diagnosis. In case of discrepancy, the final diagnosis was made by a vascular radiologist after a third independent reading.
Results: Of 91 initially identified patients, 9 were excluded owing to a lack of imaging or clinical data. There were excluded because of troponin (n = 6) or post-trauma complication (n = 4), and 11 were excluded because of limited sample size (aortic dissection (n = 5), dissecting aneurysm (n = 4), atherosclerosis disease (n = 1), Ehlers Danlos disease (n = 1)). The 61 remaining patients had dissecting hematoma (43% had 35%), fibromuscular dysplasia (FMD) (n = 16) or “dissecting or aeryural multifocal arterial disease” (DAAD) (n = 10). At diagnosis, median age was 46 [40;54] years, 70.5% were males, 43% had known hypertension for 9 [5;15] years, 6.5% diabetes, 34% had never smoke. The diurnal ambulatory BP was 138 [127;149] / 89 [81;98] mmHg with 2.8 [1.6] antihypertensive drugs. Serum creatinine was 89 [76;107] mmol/L. RAD involved the right kidney in 17 (28%), the left in 20 (33%) and both in 24 (39%) patients. Patients received antplatelet drug in 66%, anticoagulant drug in 3% and 14% were treated by angioplasty. After 51 [19;92] month follow-up, the diurnal ambulatory BP was 127 [121;133] / 84 [78;87] mmHg with 2 [1.3] antihypertensive drugs. Serum creatinine was 87 [78;102] mmol/L. Dissection of other arterial sites or RAD recurrence were more frequent in FMD (60% and 31%) and DAAD (70% and 40%), than in DH (11% and 9%) (p = 0.01 and p = 0.03) respectively.

Conclusions: In this large retrospective case-series, RAD was more frequently due to DH than FMD or DAAD, but dissection of other arterial sites or RAD recurrence were more frequent in FMD and in DAAD groups than in patients with DH.

PP.17.34 BASELINE KIDNEY FUNCTION AND BLOOD PRESSURE LEVEL ARE MAIN PREDICTORS OF ACUTE KIDNEY INJURY IN PATIENTS ADMITTED WITH CARDIAC DISEASES
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Objective: Acute kidney injury (AKI) is a common and serious problem associated with poor prognosis. The aim of the study was to assess the prevalence and predictors of AKI in patients with acute cardiac diseases.

Design and method: 566 patients (278 with decompensated heart failure (DHF), 288 with non-ST-elevation acute coronary syndrome (NSTE-ACS), 46% male, 71 ± 11 years (M ± SD), arterial hypertension 91%, previous myocardial infarction (MI) 45%, diabetes mellitus (DM) 28%, atrial fibrillation 35%, chronic kidney disease (CKD) 40%, blood pressure (BP) 142 ± 30/83 ± 16 mmHg) were examined. AKI was diagnosed according to KDIGO 2012 Guidelines. Mann-Whitney test and multivariate logistic regression analysis were considered significant if p < 0.05.

Results: AKI stage 1 was prevalent. Patients with vs without AKI had higher rate of previous MI (56.6 vs 36.7%, p < 0.001), stable angina (43.9 vs 33.9%, p < 0.05), CKD 52 vs 41.4%, p = 0.05, DM (33.6 vs 24.3%, p < 0.05), obesity (48.5 vs 39.3%, p < 0.05) acute HF or DHF at admission (74.7 vs 60.7%, p < 0.001), MI at admission (39.3 vs 28.7%, p < 0.05), anemia (38 vs 30%, p < 0.05), serum creatinine (SCr) >118 mmol/l (50 vs 22%, p < 0.01), systolic BP < 110 mmHg (16.7 vs 8.5%, p < 0.01). In-hospital mortality in patients with AKI was higher: in DHF 12.4 vs 5%, p < 0.01, in NSTE-ACS 17.8 vs 3.3%, p < 0.001. Independent predictors of AKI were: GFR < 30 mL/min/1.73 m2 (odds ratio (OR) 6.5, 95% confidential interval (CI) 3.4–12.6, p < 0.001), SCr >128 mmol/l (OR 5.5, 95% CI 3.6–8.5, p < 0.001), systolic BP < 90 mmHg (OR 4.6, 95% CI 1.2–17.1) (all parameters at admission).

Conclusions: 40% of patients admitted to the hospital with NSTE-ACS and DHF developed AKI. Patients with baseline systolic BP < 90 mmHg, GFR < 15 ml/min/1.73 m2, SCr >128 mmol/l are at high-risk for development of AKI. AKI was associated with higher in-hospital mortality.

PP.17.35 HIGH PREVALENCE AND POOR PROGNOSIS OF CARDIODENAL INTERRELATIONS IN PATIENTS WITH ACUTE CARIDAC DISEASES
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Objective: Impaired renal function is a common finding in patients with cardiac diseases, confers an adverse prognosis in this population. The aim of the study was to evaluate the incidence, phenotypes and prognostic value of cardiorenal interrelations in patients with acute cardiac diseases.

Design and method: 566 patients (278 with decompensated heart failure (DHF), 288 with non-ST-elevation acute coronary syndrome (NSTE-ACS), 46% male, 71 ± 11 years (M ± SD), arterial hypertension 91%, previous myocardial infarction (MI) 45%, diabetes mellitus (DM) 28%, previous hospitalization with DHF 36%, atrial fibrillation 35%, chronic kidney disease (CKD) 46%, blood pressure 142 ± 30/83 ± 16 mmHg, ejection fraction (EF) < 35% 15%, blood pressure (BP) 142 ± 30/83 ± 16 mmHg) were examined. AKI and acute kidney injury (AKI) were diagnosed according to KDIGO 2012 Guidelines. AKI phenotypes depending on time of development (community-acquired or in-hospital), persistence (transient or persistent), history of CKD (AKI de novo or AKI on CKD) were identified. Mann-Whitney test and multivariate logistic regression analysis were considered significant if p < 0.05.

Results: Different cardiorenal interrelations were revealed in 64.7% of patients. Incidence of CKD in all patients, patients with DHF and NSTE-ACS was 45.8, 46.5 and 45%. CKD was first diagnosed in 61% of patients. Incidence of AKI in all patients, patients with DHF and NSTE-ACS was 40, 43.5 and 37.2% respectively. AKI stage 1 was prevalent. Serum creatinine changes in range 10–50% during hospitalization which do not meet AKI criteria were revealed in 27.6% of patients. Patients with vs without AKI had higher rate of CKD stage 4 (17.4 vs 3.6%, p < 0.001), lower rate of CKD stage 3a (23.1 vs 47.8%, p < 0.001). Community-acquired AKI, AKI on CKD and persistent AKI were found in 44.7, 53.1 and 48.2% of patients respectively. In-hospital mortality was higher in patients with vs without AKI (14.9 vs 3.6%, p < 0.001) and was the highest in patients with in-hospital persistent AKI de novo, community-acquired persistent and transient AKI on CKD (30.8, 35 and 19.4%, p < 0.05).

Conclusions: 64.7% of patients admitted with acute cardiac diseases developed cardiorenal syndrome. CKD and AKI are common in patients with DHF and NSTE-ACS and associated with high in-hospital mortality.
PP.18.02 PREVALENCE OF CARDIOVASCULAR DISEASE ACCORDING TO THE TIME OF EVOLUTION OF DIABETES IN PATIENTS INCLUDED IN THE IBERICAN STUDY
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Objective: It has been previously demonstrated that T lymphocytes may be involved in the development of hypertension and microvascular remodeling, and that circulating T effector lymphocytes may be increased in hypertension (De Bembibre, Leon, Spain, 4C. S. De La Fuensanta, Cordoba, Spain, 5C. S. Ciudad Jardin, Malaga, Spain, 6C. S. Zona Centro De Càceres, Càcere, Spain)

Design and method: The IBERICAN Study is a longitudinal, observational, and multicentric study with subjects between 18 to 85 years of age, recruited in Primary Care (PC) and who will be followed up at least 5 years. The final sample size is estimated in 7,000 patients. We show the baseline characteristics of the patients in the first visit (n = 3,042). The evolution time of diabetes was classified into three categories (<5 years, 5–10 years >10 years) that divided the sample into 34.1%, 31.4% y 34.5% of the patients.

Results: The prevalence of diabetes was 19% (n = 572) and the mean evolution time was 9.1 ± 6.2 years. The prevalence of cardiovascular disease was higher in patients with longer duration of diabetes (27.0% vs 19.0% vs 32.9%, p = 0.008). The most important diseases were heart failure (5.7% vs 2.2% vs 8.7%, p = 0.023), retinopathy (0.0% vs. 0.0% vs 2.3% P = 0.025), peripheral arterial disease (7.0% vs 3.3% vs 13.1%, p = 0.001). Other ischemic diseases as stroke (3.5% vs 6.7% vs 7.8%, p = 0.266), ischemic heart disease (18.8% vs 32.8% vs 48.4%, p = 0.270) or atrial fibrillation (8.4% vs 5.5% vs 12.2%, p = 0.061), did not reach statistical significance.

Conclusions: The diabetic patients with a greater evolution time of the disease presented a higher prevalence of cardiovascular disease, although only heart failure, retinopathy and arterial disease reached statistically significant differences. We should analyze with a larger sample if this association is maintained.

PP.18.04 CHRONIC URIC ACID ELEVATION IS ASSOCIATED TO BAROREFLEX IMPAIRMENT IN HYPERTENSIVE WOMEN
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Objective: Chronic plasma uric acid elevation is known to maintain hypertension and induces irreversible vascular damage and results in a form of salt sensitive hypertension. The mechanisms suggested are activation of the renin angiotensin system and inhibition of neuronal nitric oxide synthase, which is associated to incident hypertension particularly in younger individuals and women. Thus, the aim of this work was to evaluate the relationship of uric Acid and autonomic activity in hypertensive patients.

Design and method: We evaluated in 402 HT (242 Males, 55 ± 0.9y, BMI: 28.9 ± 0.3 Kg/m²) and 160 Females (58 ± 1.0 y, BMI: 28.1 ± 0.4 Kg/m²), with normal (<100 mg/dl) or higher (>100 mg/dl) glyceremia., the Autonomic Activity and the pulse wave velocity (PWV). In each patient blood samples were drawn for biochemical evaluations and 24 h blood pressure (BP) monitoring, PWV and BMI calculated. The vagal activation (Va) or inhibition (Vi), calculated as the slope (msce/mmHg) of the reflex response to spontaneous BP increase or decrease, represent the Autonomic Activity (1 h beat to beat BP signal recording).

Results: In males mean BP was 131 ± 1.08 / 8308 / 83 ± 0.59mmHg with a PWV equal to 9.16 ± 0.16ms/sec. In females, BP was 126 ± 0.88 / 77 ± 0.83mmHg and PWV 9.01 ± 0.15ms/sec. The relationship between UA and metabolic parameters are shown in the following table:

<table>
<thead>
<tr>
<th>BMI (Kg/m²)</th>
<th>Abd. Circ. (cm)</th>
<th>HDLc (mg/dl)</th>
<th>Tgl (mg/dl)</th>
<th>Gla 125H (mg/dl)</th>
<th>Insulina (FS)</th>
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<tr>
<td>Men G100mg/dl</td>
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<td>0.23</td>
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BMI: Body Mass Index; Abd. Circ. Abdominal Circumference; HDLc: High Density Cholesterol; Tgl: Triglycerides; G125H: Glyceremia at 120 min after a Glucose Load (175 g); IB: Basal Insulin plasma Levels; G100 < 100 mg/dl and G100 > 100 mg/dl means Glyceremia Plasma Leves lower or higher than 100mg%, respectively. In women, UA was mainly related to Va (>0.371, p < 0.05) or
Vi (0.271, p < 0.05). This correlation was stronger un subjects with glycemia >100mg/dl (Vs: 0.18, p < 0.001 or Vi: 0.56, p < 0.025) than for Normo glycemic subjects (r = 0.40/ t = -0.22).

Conclusions: In hypertensive women uric acid is associated to decreased vagal activity which is know to be a predictor of cardiovascular mortality. These impairment which is higher in hyperglycemic hypertensives, supports previous information that women with hyperuricemia are at higher risk of coronary heart disease than men.

**PP.18.06**  EARLY AVERSE EFFECT OF ABNORMAL GLUCOSE METABOLISM ON LEFT VENTRICULAR MASS IN NEVER TREATED HYPERTENSIVE PATIENTS

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Objective: Left ventricular hypertrophy is independently associated with increased cardiovascular risk in hypertensive patients. Abnormal glucose metabolism has been shown to augment target organ damage, but whether there is a grading adverse effect of the progressively increased stages of dysglycemia on left ventricular mass, is not well clarified.

Design and method: We investigated 630 never treated hypertensive patients (mean age = 54 years). We stratified patients according to the glucose metabolic status into 3 groups: 1. patients with normal fasting glucose (NFG, N = 312), 2. patients with impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT) (N = 236), and 3. patients with diabetes mellitus II (DM II, N = 82). An echocardiogram was performed in all participants and left ventricular mass index (LVMI) was calculated according to the Devereux’s formula.

Results: There was a gradual increase in LVMI from patients with NFG to patients with IFG/IGT and DM II (from 119.9 to 127.7 to 129.5 g/m², p < 0.001). Post-hoc analysis showed that the difference in LVMI was significant between the groups of NFG and IFG/IGT (p < 0.001) and between NFG and DM II (p < 0.001) but no statistically significant difference was demonstrated between patients with IFG/IGT and DM II (p = NS). LVMI was independently associated with glucose metabolic group after adjustment for age, gender, smoking and mean arterial pressure (p = 0.001).

Conclusions: Early abnormal glucose abnormalities, such as IFG and IGT, are associated with increased LVMI in hypertensive patients. Moreover, the adverse effect of IFG/IGT on LVMI is comparable to that of DM II, implying that premature, significant alterations in LVMI are already shown from the prediabetic stage, without further enhancement at the diabetic status. Thus, in hypertensive patients, lifestyle and/or pharmaceutical modifications focusing on the reduction of blood glucose to the normal levels should be strongly encouraged.

**PP.18.07**  RELATIONSHIP OF ELASTIC VASCULAR WALL PROPERTIES, RENAL FUNCTION AND INFLAMMATORY BIOCHEMICAL MARKERS IN HYPERTENSIVE PATIENTS WITH METABOLIC DISORDERS

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Objective: To study the elastic properties of vascular wall, 24-hour blood pressure (BP) profile, parameters of renal function, biochemical parameters and their relationship with metabolic disorders in patients with arterial hypertension (AH) and metabolic disorders (abdominal obesity and dyslipidemia).

Design and method: 130 patients (mean age 47.20 ± 9.6 years) were divided into 2 groups. The main group (group 1) included 77 subjects with AH degree I-III and MD (mass body index (MBI) 34.5 ± 3.9 kg/m²) and the control group (group 2) contained 53 subjects with AH without MD. The parameters of 24-hour BP monitoring, sphygmography, renal function (microalbuminuria, creatinine and estimation glomerular filtration rate (eGFR) using MDRD formula), parameters of the lipid profile, inflammatory markers – homocysteine, C-reactive protein (hs-CRP) and fibrinogen were estimated.

Results: In group 1 there was registered significant increase in mean 24-hour and daytime systolic BP (SBP), time and square indices, in night time SBP and diastolic BP variability (p < 0.001); in sphygmography indices (cardio-ankle vascular index (CAVI), pulse wave velocity (PVW) and anklebrachial index (ABI) (p < 0.01); in parameters of renal function - microalbuminuria and eGFR (p < 0.001); in biochemical parameters - total cholesterol, fibrinogen (p < 0.016) and hs-CRP level (p = 0.04) compared to group 2. In group 1 correlation analysis revealed a positive correlation between microalbuminuria and PWV-R (p = 0.039), creatinine and R-ABI (p = 0.007), eGFR and L-ABI (p = 0.05), hs-CRP and CAVI and between fibrinogen and eGFR (p < 0.05). Besides, regression analysis method in patients with AH degree I revealed a positive relationship of creatinine with PWV-L (R² = 0.14, p = 0.03), in patients with AH degree II - creatinine with CAVI and MBI (R² = 0.451, p = 0.004 and p = 0.012).

Conclusions: The relationship between elastic parameters of vascular wall, inflammatory markers, parameters of renal function and MBI has a pathogenetic basis for the progression of hypertension and impaired function of the target organ.

**PP.18.10**  IMPACT OF SHORT-TERM CPAP TREATMENT ON DAY- AND NIGHTTIME ACTIVITY IN OBSTRUCTIVE SLEEP APNEA HYPERTENSIVE PATIENTS

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Objective: Obstructive Sleep Apnea (OSA) via disruption of physiological sleep pattern may alter both nighttime and diurnal physical activity of untreated patients. CPAP-therapy constitutes a method of choice for moderate-to-severe OSA. Several clinical markers suggest the effectiveness of CPAP treatment incl. refreshing sleep. Whether a subjective better performance during daytime after CPAP translates into altered activity in hypertensive patients remains to be determined. The aim of the study was to assess the impact of OSA and OSA-treatment on activity patterns of hypertensive patients subjected to short-term CPAP.

Design and method: 195 consecutive patients with moderate-to-severe OSA were enrolled to the study (25% female, age 58 ± 10.0 years; mean ± SD; BMI = 34.7 ± 5.8 kg/m²). Patients were instrumented with actigraphy recorder ACTIWATCH Philips for 7 consecutive days/night, at baseline, and while on CPAP. Objectively assessed therapy effectiveness was based on CPAP logs i.e.: Δt = 5%h; and median usage % per night.

Results: A total of 159 patients completed the protocol. Mean actigraphy recordings lasted 6.94 and 6.53 days before, and during CPAP treatment, respectively. Several baseline actigraphic measurements correlated with PSG-derived indices i.e.: Total sleep time(Acti) vs. SpO2(PSG) R = 0.21; P = 0.01; Sleep efficiency(Acti) vs. Mean oxygen saturation(PSG) R = 0.27; P < 0.001; Sleep efficiency(Acti) vs. T90 - oxygen saturation < 90% (PSG) R = -0.17; P = 0.04. In the subset of patients with effective CPAP there was an evident difference in daytime activity before vs. during CPAP: 14.57*10³AU vs. 15.36*10³AU vs. 15.36*10³AU, P = 0.03, respectively; but not during nighttime P = 0.51. There was a positive relationship between increased daytime activity and severity of OSA measured as T90 (R = 0.21; P = 0.04). Patients with ineffective CPAP had similar activity at baseline, and during therapy.

Conclusions: Untreated OSA affects day/night pattern of physical activity of untreated patients with hypertension, and the magnitude of desaturations best predict such dearrangement. Effective short-term CPAP appears to enhance daytime activity whilst the night-time activity remains intact. Whether alterations in activity patterns during CPAP play the role in cardiovascular control in OSA patients warrants further studies.

**PP.18.11**  INFLUENCE OF CPAP THERAPY ON ENDOTHELIAL FUNCTION IN PATIENTS WITH TYPE 2 DIABETES ACCORDING TO FLOW-MEDIATED VASODILATION

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Objective: to assess the dynamics of parameters of endothelial function in patients with type 2 diabetes, suffering from medium to severe obstructive sleep apnea (OSA).

Design and method: 42 subjects with diabetes and moderate to severe OSA were examined. During 12 weeks 22 patients (group 1 CPAP) in addition to an- tihypertensive treatment (AHT) received CPAP-therapy with sSOMObalance (Weinnmann, Germany). Control group (C) included 20 patients without additional treatment by CPAP. The subjects were matched by age, sex, height, office blood pressure values. All enrolled patients had arterial hypertension 1-2 degrees. Assessment of respiratory disorders during sleep was carried out using cardio-respiratory monitoring device SOMOcheck2 (Weinnmann, Germany). Endothelial function was evaluated by the ultrasonic device MyLab 90 (Esaote, Italy). Index of reactivity (IR), flow-mediated dilation (FMD), the diameter of the common carotid artery (DCCA) and the intima-media thickness (IMT) on the right and left were assessed.
Results: Initially there were no significant differences between groups for all parameters of comorbidities, reflecting endothelial function. In CPAP group baseline values of IR were 13 ± 0.3, FMD - 8.4 ± 4.9%, DCCA - 7 ± 1.1 mm, IMT - 1.1 ± 0.2 mm. During the CPAP-therapy IR increased to 1.5 ± 0.3 (15.7%, p < 0.05), FMD to 12.2 ± 3.0% (45.2%; p < 0.05), DCCA and IMT values after 12 weeks decreased to 6.95 ± 1.1 mm (ns) and 1.0 ± 0.1 mm, respectively (p < 0.05). In patients of control group the IR at baseline was 1.2 (1.1; 1.4), FMD - 7.5 (5; 9.5)% DCCA IMT - 6.2 (5.4; 6.5) mm, IMT - 1.0 ± 0.1 mm. In the control group FMD increased to 8.9 ± 5.3% (15.5%; p < 0.05). IR values, IMT and DCCA were not significantly changed in control group, and amounted to 1.5 ± 0.4; 5.7 ± 1.0 mm, and 1.0 ± 0.1 m/s, respectively.

Conclusions: the application of CPAP in patients with diabetes and apnea syndrome contributes to a significant improvement in endothelial function according to flow-mediated dilation.

**PP.18.13**

**NEWLY DIAGNOSED DIABETES MELLITUS: BLOOD PRESSURE LEVELS ARE ASSOCIATED WITH VASCULAR DAMAGE**

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Objective: Management of type 2 diabetes mellitus (DM) focuses on early detection of comorbidities and organ damage. Design and method: We aimed to characterize patients with newly-diagnosed DM and detect indices of micro- and macro-vascular damage. We studied consecutive patients with newly-diagnosed DM during January 2015-December 2016. We recorded demographics, cardiovascular risk factors, office and 24-hour blood pressure (BP) measurements (Spacelabs), microalbuminuria (24-hour urine collection) and pulse-wave velocity (PWV) using application tonometry (Sphygmocor). Data are presented as mean ± standard deviation or median (interquartile range).

Results: We studied 57 patients (aged 57 ± 11 years, 25 male: 22 female) at 2.4 months from DM diagnosis. Among them, 24(42%) received no treatment, while 33(58%) received only metformin for 1.4(1.8) month. Day systolic / diastolic BP were diagnosed simultaneously with DM diagnosis. Significant differences were found in patients with newly-diagnosed compared to known hypertension regarding higher day systolic BP (143.7 ± 11.5 versus 127.7 ± 13.4 mmHg, p = 0.001) and higher rates of microalbuminuria (p = 0.009). A trend towards statistical significance was found for PWV [9.8 (4) versus 8.6 (2) m/sec, p = 0.065]. In the multivariate analysis, BP levels (p = 0.034) proved to be the only independently significant difference between the two groups. We further investigated factors associated with PWV in this population. Age (p = 0.001) and day systolic BP (p = 0.005) were associated with PWV in the multivariate model, independently of factors with univariate associations including hypertension duration and glucose levels. Conclusions: Our study indicates that newly-diagnosed hypertension is found in a significant portion of patients newly-diagnosed for DM. Increased awareness is needed among physicians dealing with these patients since delay in hypertension diagnosis is associated with micro- and macro-vascular damage. Therefore, early hypertension diagnosis plays a key role in vascular protection of diabetic patients.

**PP.18.14**

**ASSOCIATION BETWEEN ONE-HOUR POST-LOAD PLASMA GLUCOSE LEVELS AND ARTERIAL STIFFNESS IN NORMOTENSIVE SUBJECTS WITH NORMAL GLUCOSE TOLERANCE**

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Objective: Elevated one-hour post-load plasma glucose (1h-PG) during an oral glucose tolerance test is associated with subclinical organ damage like carotid atherosclerosis and left ventricular hypertrophy. The aim of this study was to investigate whether 1h-PG affects arterial stiffness, determined by brachial-ankle pulse wave velocity (baPWV), in normotensive subjects with normal glucose tolerance (NGT).

Design and method: Study subjects were 25-, 30-, 35-, 40-, 45-, 50- and 55-year-old non-industrial workers (n = 8381) who underwent a regular health check-up programme every 5 years. We included only subjects with NGT according to the American Diabetes Association criteria, namely, fasting plasma glucose concentrations of < 100 mg/dl, and 2-hour post glucose load plasma glucose (2h-PG) concentrations of < 140 mmHg and HbA1c level < 5.7%. We excluded subjects with hypertension, taking any medication, and having an abnormal ankle-brachial index (ABI) (ABI <= 1.0, ABI >= 1.3). The final sample consisted of 4970 participants (2048 female).

Results: 1h-PG showed significant correlation with baPWV only in male subjects, but not in female subjects (male: r = 0.18, p = 0.001, female: r = 0.02, p = 0.30). The correlation in male subjects remained significant after adjustment for confounders (male: β = 0.04, p = 0.02, female: β = -0.03, p = 0.10). Fasting plasma glucose (FPG) and 2-hour plasma glucose (2h-PG) did not significantly correlate with baPWV in multivariate analysis in male subjects (FPG: β = 0.018, p = 0.25; 2h-PG: β = -0.002, p = 0.89). As we found significant interaction between 1h-PG and age (p = 0.04) in male group, we performed analysis in each age-subgroup. After adjustment for possible confounders, the correlations between 1h-PG and baPWV was significant in 55-years-of-age group (β = 0.11, p = 0.02) and border significant in 45-years-of-age group (β = 0.07, p = 0.09) and 50-years-of-age group (β = 0.08, p = 0.08). In these groups, baPWV values of subjects had 1h-PG >= 155 mg/dl were significantly higher than those of subjects had 1h-PG < 155 mg/dl.

Conclusions: Elevated 1h-PG was associated with arterial stiffness in middle-aged male subjects with normotension and NGT.

**PP.18.15**

**EFFECT OF LONG-TERM USE OF CONTINUOUS POSITIVE AIRWAY PRESSURE TREATMENT ON BLOOD PRESSURE IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA AND RESISTANT HYPERTENSION**

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Objective: To evaluate the impact of a long-term use of CPAP on clinic and ambulatory blood pressure (BP) in patients with resistant hypertension (RHT) and obstructive sleep apnea (OSA)

Design and method: An observational prospective study was performed in 66 patients with RHT and moderate/severe OSA (AHI>15/hour), using CPAP for at least 12 months. Clinic BP and 24-hour BP were obtained before and after follow-up. Primary outcomes were changes in clinic and ambulatory BPs, and BP control. The differences of BP from the beginning to the end of the study were evaluated with a paired t test, adjusted by baseline BP. A per-protocol analysis was performed limited to patients with uncontrolled ambulatory BP levels at baseline.

Results: 66 patients [64% females, mean (SD) age: 62(8) years] were follow-uped for a median of 20 [15–35] months. They used a median of 5 [3–8] antihypertensive drugs and had mean (SD) clinic BPs of 151(26)/86(17) mm Hg and ambulatory 24-hour BPs of 128(17)/75(11) mmHg; 61% of them had uncontrolled ambulatory BP levels at baseline. The average use of CPAP treatment was 5 (1.9) hours per night, with 78% using it at least 4 hours per night. A significant reduction of 24-hour (-3.7 [-7.7 to + 0.2] mmHg, p < 0.04) and daytime (-5.6 [-10.1 to – 1.1] mmHg, p = 0.02) systolic ambulatory BP was found. Controlled ambulatory BP increased from 39% to 57%. In a per-protocol analysis, 48 patients with baseline uncontrolled ABPM were evaluated. They achieved a significant decrease in clinic systolic BP (-7.4 [-11.4 to + 3.2] mmHg, p = 0.04) and in systolic and diastolic ambulatory BP in all periods: 24-hour (-14.6 [-21.0 to – 8.2]/-7.4 [-10.8 to -4.3] mmHg, daytime (-13.7 [-10.8 to – 3.8]/-7.7 [-11.3 to -4.3] mmHg) and nighttime (-8.6 [-15.2 to -1.9] /-4.1 [-7.1 to – 1.0]) mmHg.

Conclusions: The treatment of OSA with long-term use of CPAP significantly reduces blood pressure in patients with resistant hypertension, especially in those with uncontrolled ambulatory BP at baseline.

**PP.18.16**

**SUBCLINICAL MYOCARDIAL INJURY IN YOUNG TYPE 1 DIABETIC PATIENTS (DM) WITHOUT CORONARY ARTERY DISEASE**

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Objective: to study the impact of Type1 DM on systolic and diastolic functions of left ventricle in young patients without coronary artery disease (CAD) and identify factors associated with the dysfunction of global longitudinal systolic deformation.

Design and method: Young patients with Type1 DM without CAD (n = 71) were included in the study. All patients were conducted treadmill test to exclude...
Objective: Sleep apnea syndrome is a known cardiovascular risk factor underestimated in women, yet common especially in post menopausal. Clinical pre-menopausal is often atypical causing late diagnosis. Thus, its screening should be improved. The objective was to assess the relevance of screening for obstructive sleep apnea syndrome in post-menopausal women at cardiovascular risk and identify which specific factors target women more effectively.

Design and method: We undertook a retrospective observational study based on a cohort of post-menopausal women followed through the care pathway “Heart, arteries and women”, at the Lille University Hospital, between January 1st, 2013 and December 31st, 2014. All women underwent night polygraphy or polysomnography. Clinical characteristics, symptoms and screening questionnaires (Epworth sleepiness scale, Berlin questionnaire and Pichot scale) were collected. Sleep apnea syndrome was diagnosed in case of apnea-hypopnea index (AHI) >5.

Results: Obstructive sleep apnea syndrome was diagnosed in 73% of the 91 participants. Of these, severity was stratified as mild (S>AHI <15) in 27 (41%) patients, moderate (15 ≤ AHI <30) in 10 (15%), severe (AHI>30) in 16 (24%) and unknown in 13 (20%). Thirty-four women (37%) were treated with continuous positive airway pressure. Absence of decrease of nocturnal systolic blood pressure (<10 %) was found in 49% of patient with a diagnosis of sleep apnea syndrome. High cardiovascular risk was significantly predictive for diagnosis of sleep apnea syndrome was (OR 4.8, p = 0.0012). No differences were present between sleepy and non-sleepy subjects in regard to other clinical characteristics and questionnaires.

Conclusions: Screening for obstructive sleep apnea syndrome in post-menopausal women at cardiovascular risk was efficient. Women at high cardiovascular risk should be primary targets of screening. Self-screening questionnaires are not enough discriminant and should be adapted to women’s specificities.

PP.18.17 HEART RATE VARIABILITY IN YOUNG PATIENTS WITH TYPE 1 DIABETES MELLITUS IS A MARKER OF CARDIAC AUTONOMIC NEUROPATHY
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Objective: Type 1 diabetes mellitus (T1DM) is an independent risk factor for the development of cardiovascular disorders, including dysrhythmias, sometimes leading to fatal outcomes. Cardiac autonomic neuropathy (CAN) is considered to be the main mechanism of rhythm disturbances. Assessment of heart rate variability (HRV) is one of the methods applied to determine the predictors of CAN development.

Purpose: To study HRV parameters in young T1DM patients without coronary artery disease (CAD) and history of dysrhythmias.

Design and method: The study included 71 patients with T1DM [mean age 28.7 years, 41 (57%) male, mean glycated hemoglobin 9.9% (84 mmol/mol), mean body mass index 23.4 kg/m<sup>2</sup>, mean diabetes duration 6.84 (0.5; 24) years, mean NT-proBNP 62.62 pg/ml, mean LV EF 61.7%]. Subclinical systolic dysfunction, tricuspid annular plane systolic excursion, tricuspid annular plane systolic excursion were considerably lower in patients with GLS < 20% than in patients with GLS>20% (p < 0.05). Furthermore, E/e<sub>r</sub> mitral annular plane systolic excursion, tricuspid annular plane systolic excursion were considerably lower in patients with GLS < 20% than in patients with GLS>20% (p < 0.05). LA volume index was higher in patients with GLS < 20%, but the difference was statistically insignificant (p > 0.1). LV diastolic dysfunction with slow relaxation was observed in 5.6 (4/45) patients with GLS < 20% unlike patients with GLS>20% without diastolic dysfunction. Multivariate regression analysis showed that albuminuria is an independent determining factor of E/e<sub>r</sub> (β = 0.22, p < 0.001) as well as the age (β = 0.36, p < 0.001) and female gender (β = 0.24, p < 0.004), and GFR strongly correlated with GLS (r = 0.28, p < 0.006). Strong correlation was also found between GFR and GLS (r = 0.29, p < 0.05; r = 0.62), and between albumin/creatinine ratio (r = 0.27, p = 0.05, r = 0.56).

Conclusions: Global longitudinal systolic LV myocardial deformation is a sensitive marker of subclinical myocardial injury in young type1 DM patients without CAD. Significant correlation was found between GFR < 90 ml/min/1.73 m<sup>2</sup> and uACR tests were also performed. Echocardiography showed albuminuria is an independent determining factor of E/e<sub>r</sub> (β = 0.22, p < 0.001) as well as the age (β = 0.36, p < 0.001) and female gender (β = 0.24, p < 0.004), and GFR strongly correlated with GLS (r = 0.28, p < 0.006). Strong correlation was also found between GFR and GLS (r = 0.29, p < 0.05; r = 0.62), and between albumin/creatinine ratio (r = 0.27, p = 0.05, r = 0.56).

PP.18.19 URIC ACID AND METABOLIC SYNDROME COMPONENTS IN HYPTERTENSIVE PATIENTS. DIFFERENCES BETWEEN MEN AND WOMEN STRATIFIED BY THE MENOPAUSAL STATUS
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Objective: Arterial hypertension is a component of metabolic syndrome (MS) while both are related to increased cardiovascular risk. High serum uric acid (UA) has been reported as additional cardiovascular risk factor. The aim of this study was to assess the relation of UA levels to MS and its components in hypertensive patients. Possible differences between men and women, as well as within women’s group according to their menopausal status were also examined.

Design and method: The study comprised all hypertensives referred to our institutions from 1985 to 2016 (n = 20450, 57.9 ± 13.9 years). Women’s menopausal status (pre-menopause, post-menopause, hysterectomy) was recorded. The presence of MS and the number of MS components were defined according to the National Cholesterol Education Program - Adult Treatment Panel III criteria. Serum UA was measured.

Results: Metabolic syndrome was present in 8898 of the 20450 patients examined (43.5%), in 4999 of the 10949 men (45.7%), in 3899 of the 9501 women (41.0%), in 648 of the 2428 pre-menopause individuals (26.7%), in 2758 of the 5923 post-menopause individuals (46.6%) and in 493 of the 1150 individuals with hysterectomy (42.9%). Patients with MS had increased UA levels compared to non-MS subjects in all subgroups: 5.94 versus 4.94 mg/dl in the whole cohort, 6.32 versus 5.58 mg/dl in men, 5.45 versus 4.25 mg/dl in women, 5.02 versus 3.98 mg/dl in pre-menopause individuals, 5.54 versus 4.37 mg/dl in post-menopause individuals, 5.50 versus 4.41 mg/dl in individuals with hystectomy (all p < 0.001). Increasing number of MS components (1, 2, 3, 4 and 5) was related to increasing UA levels in all subgroups: 4.72, 5.16, 5.60, 5.98 and 6.78 mg/dl in the whole cohort; 5.37, 5.79, 6.64, 6.34 and 7.09 mg/dl in men; 4.06, 4.47, 5.02, 5.55 and 6.41 mg/dl in women; 3.89, 4.11, 4.65, 5.23 and 6.09 mg/dl in pre-menopause individuals; 4.14, 4.59, 5.11, 5.61 and 6.47 mg/dl in post-menopause individuals; 4.18, 4.66, 5.07, 5.63 and 6.34 mg/dl in individuals with hystectomy (all p for trend < 0.01).

Conclusions: Metabolic syndrome and its severity are related to UA levels in hypertensive patients, both men and women regardless of their menopausal status.
MUSCLE SYMPATHETIC NERVE ACTIVITY IS ASSOCIATED WITH ELEMENTS OF THE PLASMA LIPIDOMIC PROFILE IN YOUNG ASIAN ADULTS AT LOWER LEVELS OF OBESITY

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Objective: Asian subjects are at increased cardio-metabolic risk at comparatively lower BMI compared with Caucasians. Sympathetic nervous system activation and dyslipidemia, both characteristics of increased adiposity, appear to be related. We therefore analysed the association of muscle sympathetic nerve activity (MSNA) with the plasma lipidomic profile in young Asian and Caucasian subjects.

Design and method: Blood samples were collected from 101 participants of either Asian or Caucasian background, aged 18–30, body mass index (BMI) 28.1 ± 5.9 kg/m2. Lipids were extracted from plasma and analysed using electrospray ionization-tandem mass spectrometry. MSNA was quantified using microneurography. The association of MSNA and obesity with lipid species was examined using linear regression analysis.

Results: Despite Caucasians having greater BMI and waist circumference there was no difference in blood pressure or MSNA between groups. The plasma concentration of total dihydroceramide, ceramide, GM3 ganglioside, lysosphingomyelin, lysophosphatidylcholine, alkenylphosphatidylethanolamine and lyso-phosphatidylcholine were elevated in the Asians compared to Caucasians. After adjustment for confounders, di- and triacylglycerols, cholesterol esters, phosphatidylcholines, phosphatidylethanolamines and phosphatidylglycerols bore significant association with MSNA but only in the Asians. These associations remained significant after further adjustment for the participants’ degree of insulin resistance and appeared not to be related to difference in diet macronutrient content between groups.

Conclusions: The lipidomic profile differs between Asian and Caucasian subjects. There exists a strong relationship between certain lipid species and MSNA. Despite having a lower BMI the association is stronger in the Asians. This study adds further support of the interaction between circulating lipids and central sympathetic outflow. Whether the stronger association between the lipid profile and sympathetic activation underpins the apparent greater risk posed by increased adiposity in Asians merits further attention.

EFFECTS OF MOXONIDINE AND LOW CALORIE DIET IN YOUNG OVERWEIGHT MALES

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Objective: Elevated sympathetic nervous system activity in overweight individuals is believed to play a detrimental role in metabolic and cardiovascular health in early adulthood. We therefore aimed to compare the effects of a treatment with either a low calorie diet, a sympatholytic agent or a combination of both on hemo-dynamic and metabolic parameters and renal and endothelial function.

Design and method: Blood samples were collected from 101 participants of either Asian or Caucasian background, aged 18–30, BMI 28.1 ± 5.9 kg/m2. Lipids were extracted from plasma and analysed using electrospray ionization-tandem mass spectrometry. MSNA was quantified using microneurography. The association of MSNA and obesity with lipid species was examined using linear regression analysis.

Results: Despite Caucasians having greater BMI and waist circumference there was no difference in blood pressure or MSNA between groups. The plasma concentration of total dihydroceramide, ceramide, GM3 ganglioside, lysosphingomyelin, lysophosphatidylcholine, alkenylphosphatidylethanolamine and lyso-phosphatidylcholine were elevated in the Asians compared to Caucasians. After adjustment for confounders, di- and triacylglycerols, cholesterol esters, phosphatidylcholines, phosphatidylethanolamines and phosphatidylglycerols bore significant association with MSNA but only in the Asians. These associations remained significant after further adjustment for the participants’ degree of insulin resistance and appeared not to be related to difference in diet macronutrient content between groups.

Conclusions: The lipidomic profile differs between Asian and Caucasian subjects. There exists a strong relationship between certain lipid species and MSNA. Despite having a lower BMI the association is stronger in the Asians. This study adds further support of the interaction between circulating lipids and central sympathetic outflow. Whether the stronger association between the lipid profile and sympathetic activation underpins the apparent greater risk posed by increased adiposity in Asians merits further attention.

DYNAMICS OF VASCULAR ENDOTHELIAL GROWTH FACTOR AND ANGIPOIETIN-2 BLOOD LEVELS IN PATIENTS WITH HYPERTENSION AND ABDOMINAL OBESITY AFTER ONE YEAR COMBINED ANTYHYPERTENSIVE

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Objective: Vascular endothelial growth factor (VEGF) and angiopoietin-2 (Ang-2) are one of the key proangiogenic factors and can play an important role in vessel remodeling. The aim of study was to investigate the dynamics of blood levels of this factors in patients with hypertension (H) and abdominal obesity (AO) after one year combined antihypertensive and hypolipidemic treatment.

Design and method: Seventy 2nd and 3rd degree H and 1st and 2nd class AO patients (54 men and 16 women, aged 40 to 69 years) were examined before and after one year of combined olmesartan (20–40 mg/day) + lercanidipine (10–20 mg/day) treatment with addition of niacin (5 mg/day) and indapamid (2.5 mg/day) in the cases of unachievement target blood pressure (BP) values. All of the patients were also treated with atorvastatin (20 mg/day). VEGF and Ang-2 blood levels were determined using the ELISA immunoenzyme method.

Results: Significantly higher VEGF(162,31(102,67; 226,41) pg/ml) and Ang-2 (2143,95 (1870,32; 2527,20) pg/ml) blood levels have been discovered in patients with H and AO in comparison to normotensive control subjects without AO (89,07(61,43; 135,57) pg/ml and 1217,23 (1165,89; 1281,75) 162,01 ± 16,29 pg/ml). After one year of treatment, target BP values were achieved in 84% patients. One year treatment resulted in a substantial decrease in blood levels of VEGF on the group of patients on the whole. Changes of Ang-2 blood levels appeared to depend on the effectiveness of antihypertensive therapy. Only in cases where target BP values were attained. Ang-2 blood levels were markedly reduced (from 2124,35 (1825,91; 2602,69) pg/ml to 1548,85(1370,20; 1768,23) pg/ml, p < 0,01).

Conclusions: It has been determined the expressed increase VEGF and Ang-2 blood levels in patients with H and AO. The prolonged antihypertensive and hypolipidemic treatment allows to decrease the blood level of VEGF in this group of patients. But a substantial decrease in blood levels of Ang-2 was found only in cases where target BP values were attained.

INTRARENAL VASCULAR RESISTANCE AND CIRCULATING BLOOD PRESSURE PROFILE IN HYPERTENSIVE DIABETIC PATIENTS

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Objective: The aim of the study was to assess the relationship of intrarenal vascular resistance level with clinical parameters and daily rhythm of blood pressure (BP) in hypertensive diabetic patients.

Design and method: We studied 130 hypertensive patients with type 2 diabetes (m/f 40/90, 55,4 ± 7,4 yrs, office BP 142,2 ± 14,3/86,3 ± 9,7 mmHg, HbA1c 7,8 ± 2,3%, eGFR 81,9 ± 18,7 ml/min/1,73m2). 11% and 21,5% included pts had stage 3 chronic kidney disease (CKD) and microalbuminuria, respectively. Regular cardioactive therapy received 73 patients. Intrarenal vascular resistance (IRVR) was estimated by renal duplex ultrasound. The resistance index (RI) values in the main renal arteries, interlobar and arcuate interrenal arteries were calculated. Twenty four hour ambulatory BP recordings were performed. We assessed creatinine level, daily rate of albumin excretion. An estimated glomerular filtration rate (eGFR) was calculated using the MDRD equation.

Results: RI in arcuate interrenal arteries was positively correlated (p < 0,001) with age (Rs = 0,503), pulse BP-day (Rs = 0,364) and BP-night (Rs = 0,374) and negative correlated with diastolic BP-day (Rs = -0,419), BP-night (Rs = -0,350) and eGFR (Rs = -0,380). RI levels in the interlobar arteries were lower in dippers compared with night-peakers: 0,64 ± 0,06 vs 0,70 ± 0,06 (p < 0,01). Among non-dippers and night-peakers we selected pts with normal (Gr.1) and increased remaining unchanged. Endothelial function remained unchanged in all groups. In the LCD + MOX, additional benefits included decreased waist circumference (-8,3 ± 1,9 cm), decreased total cholesterol (-0,78 ± 0,23 mmol/l) and LDL cholesterol (-0,49 ± 0,16 mmol/l) and fasting insulin (-6,5 ± 2,8 mmol/l) and attenuated glomerular hyperfiltration from 187 ± 4 to 167 ± 4 ml/min.

Conclusions: The addition of moxonidine to a LCD may have beneficial effects on the metabolic profile and renal function of overweight young males.

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values of RI in acute arteries (Gr.2). Pts of Gr.2 showed higher pulse BP-night (64.6 ± 12.4 vs 55.9 ± 9.3 mm Hg), the lowest level of eGFR (77.3 ± 22.2 vs 85.7 ± 15.6 ml/min/1.73m²), they were older, had a greater duration of hypertension, more frequent prevalence of CKD and carotid atherosclerosis (p < 0.05). Moreover, pts of Gr.2 with and without CKD showed similar clinical data and no differences in increased IRVR levels, which was due to the decrease in end-diastolic velocity of renal blood flow.

Conclusions: Our data demonstrate strong correlation between the renal hemodynamics and daily rhythm of BP and suppose that the increase in IRVR accompanied with disturbed circadian rhythm of BP may be a marker of vascular and renal involvement in hypertensive diabetic patients.

Objective: To study the dynamics of clinical and psychological parameters in patients with OSA and hypertension within a month after initiation of CPAP therapy.

Design and method: The study involved 180 patients with arterial hypertension (AH) and obstructive sleep apnea syndrome (OSA) including 128 men, aged 55 ± 9.7 years and 52 women, aged 64 ± 6.9 years. Patients of cardiological department with high predictive probability of OSA according Strading questionnaire to identify OSA and outpatients were included in the study. Thus, the study included 55 patients with mild OSA (5>apnea/hypopnea index (AHI) < 15), 35 patients with moderate severity of OSA (15>AHI < 30), and 90 patients with severe OSA (AHI>30). The study involved 60 patients with Stage 1 hypertension, 61 patients with Stage 2 hypertension and 59 with Stage 3 hypertension. Diagnosis based on cardiorespiratory monitoring was performed using the Sonite Compmedics (Australia) device. After the diagnosis of OSA was confirmed, patients filled in the following questionnaires natures: WHOQOL, The Beck Depression Inventory, Spielberger’ s State Anxiety Inventory, Epworth Sleepiness Scale. CPAP therapy was initiated in 54 patients. Within a month, 40 patients were assessed on the adherence of CPAP (Continuous Positive Airway Pressure) therapy and dynamics of clinical and psychological factors, with the help of Wilcoxon signed-rank test. 30 patients out of 40 have good adherence to CPAP therapy (mean time of CPAP usage is 5.8 ± 1.1 hours), and 10 – don’t (mean time of CPAP usage is 2.6 ± 0.9 hours).

Results: Patients who have agreed to CPAP therapy were assessed on the dynamics of clinical and psychological parameters at baseline and after one month of CPAP use. There was a statistically significant decrease of the level of daytime sleepiness, the level of depression and the level of anxiety (p < 0.05). However, the quality of life significantly decreased (p < 0.05).

Conclusions: Patients with hypertension and obstructive sleep apnea against the background of CPAP therapy one month later have shown a decrease of daytime sleepiness, depression and anxiety level. However, the quality of life significantly decreased, which is probably due to the lack of adaptation to CPAP machine for a specified period of time.

Objective: Obstructive sleep apnea (OSA) is a risk factor for hypertension and if left untreated, is associated with high cardiovascular morbidity and mortality. Continuous positive airway pressure (CPAP) is considered the therapy of choice for moderate and severe OSA. (CPAP) reduces peripheral blood pressure and arterial stiffness. Arterial stiffness is measurable and evaluated by pulse wave velocity (PWV) and augmentation index as early markers of atherosclerosis and cardiovascular (CV) risk. The aim was to assess the early effects of (CPAP) on augmentation index and pulse wave velocity of arterial stiffness in patients with (OSA) and arterial hypertension.

Design and method: The patients divided into two groups: each group was thirty patients, the first group: moderate OSA with hypertension, the second group: severe OSA with hypertension. Inclusion criteria: Patients referred to the Sleep Clinic of the chest Department, because of snoring or sleepiness with confirmed moderate-to-severe OSA (apnea/hypopnea index >15/h and >30/h) and known to have hypertension on continuous antihypertensive treatment with BP less than 140/90 mmHg. Sleep study was done to confirm the diagnosis of OSA. Ambulatory blood pressure monitoring was done to confirm the diagnosis of hypertension. Non-invasive assessment of central aortic pressure and measuring Pulse wave velocity and augmentation index. CPAP intervention with non-invasive ventilation by CPAP. Follow-up was done after 12 weeks of CPAP intervention.

Results: The effective CPAP treatment after 12 weeks showed significant BP reduction, in central systolic BP (6.2 ± 1.6 mmHg, P < 0.005), diastolic BP (4.4 ± 0.7 mmHg, P < 0.001) and, brachial systolic BP (5.4 ± 1.4 mmHg, P < 0.03) and diastolic BP (4.2 ± 0.8 mmHg, P < 0.05), and achieved PWV reduction by 1.7 ± 1.2 m/sec (P < 0.005) and a significant reduction in augmentation index (the augmentation index was 24.8% ± 11.9%) and the significant reduction in augmentation index up to 6.1% (P < 0.05).

Conclusions: the effective CPAP reduces both central aortic and peripheral blood pressure and improvements in arterial stiffness parameters. The effective reduction of augmentation index and arterial stiffness will prevent cardiovascular morbidity and mortality.

Objective: Variations in absolute hemoglobin levels and glycabilities among individuals are major non-glycemic drivers of the discordance between HbA1c and glucose-based tests in classifying glucose tolerance statuses. We investigated whether low hemoglobin levels and glycation gaps (the difference between measured and predicted HbA1c) account for the discordance between HbA1c and glucose-based tests in the diagnosis of abnormal glucose tolerance in African populations.

Conclusions: Obstructive sleep apnea against the background of CPAP therapy one month later have shown a decrease of daytime sleepiness, depression and anxiety level. However, the quality of life significantly decreased, which is probably due to the lack of adaptation to CPAP machine for a specified period of time.

Objective: The patients divided into two groups: each group was thirty patients, the first group: moderate OSA with hypertension, the second group: severe OSA with hypertension. Inclusion criteria: Patients referred to the Sleep Clinic of the chest Department, because of snoring or sleepiness with confirmed moderate-to-severe OSA (apnea/hypopnea index >15/h and >30/h) and known to have hypertension on continuous antihypertensive treatment with BP less than 140/90 mmHg. Sleep study was done to confirm the diagnosis of OSA. Ambulatory blood pressure monitoring was done to confirm the diagnosis of hypertension. Non-invasive assessment of central aortic pressure and measuring Pulse wave velocity and augmentation index. CPAP intervention with non-invasive ventilation by CPAP. Follow-up was done after 12 weeks of CPAP intervention.

Results: The effective CPAP treatment after 12 weeks showed significant BP reduction, in central systolic BP (6.2 ± 1.6 mmHg, P < 0.005), diastolic BP (4.4 ± 0.7 mmHg, P < 0.001) and, brachial systolic BP (5.4 ± 1.4 mmHg, P < 0.03) and diastolic BP (4.2 ± 0.8 mmHg, P < 0.05), and achieved PWV reduction by 1.7 ± 1.2 m/sec (P < 0.005) and a significant reduction in augmentation index (the augmentation index was 24.8% ± 11.9%) and the significant reduction in augmentation index up to 6.1% (P < 0.05).

Conclusions: the effective CPAP reduces both central aortic and peripheral blood pressure and improvements in arterial stiffness parameters. The effective reduction of augmentation index and arterial stiffness will prevent cardiovascular morbidity and mortality.

Objective: Variations in absolute hemoglobin levels and glycabilities among individuals are major non-glycemic drivers of the discordance between HbA1c and glucose-based tests in classifying glucose tolerance statuses. We investigated whether low hemoglobin levels and glycation gaps (the difference between measured and predicted HbA1c) account for the discordance between HbA1c and glucose-based tests in the diagnosis of abnormal glucose tolerance in African populations.

Conclusions: Obstructive sleep apnea against the background of CPAP therapy one month later have shown a decrease of daytime sleepiness, depression and anxiety level. However, the quality of life significantly decreased, which is probably due to the lack of adaptation to CPAP machine for a specified period of time.
Town. Internationally advocated cut-offs were used to classify glucose tolerance status based on oral glucose tolerance test (OGTT) results and HbA1c levels. Correlation/regressions methods were used to predict HbA1c from simultaneously measured fructosamine levels.

Results: OGTT-based glucose tolerance status distribution was normotolerance (72.1%), prediabetes (19.7%) and diabetes (8.2%). HbA1c equivalents were 39.3%, 48.4% and 12.2%. Predicted HbA1c and absolute glycation gap varied significant (and in the same direction) across OGTT and HbA1c defined glucose tolerance statuses (all p < 0.0002). Total haemoglobin decreased with prevalent anaemia increased (both p < 0.0001) with worsening of HbA1c-defined glucose tolerance. For instance the prevalence of anaemia was 14.6%, 20.6% and 26.8% in normotolerant, prediabetics and diabetics respectively. Mean corpuscular volume, mean concentration of haemoglobin, ion levels decreased, while red cell distribution width increased with worsening of HbA1c-based glucose tolerance (all p < 0.0001). Total haemoglobin and all red cell related parameters were similar across OGTT-defined glucose tolerance status. The agreement between OGTT and measured HbA1c in classifying glucose tolerance status was kappa 0.23 (95%CI: 0.17–0.28) overall, 0.10 (0.01–0.20) in anaemic and 0.26 (0.20–0.32) in non-anaemic participants. Equivalent figures after correction for glycation gap using measured fructosamine levels were 0.20 (0.15–0.26), 0.28 (0.15–0.41) and 0.18 (0.12–0.24).

Conclusions: The low agreement between OGTT and HbA1c in classifying glucose tolerance status in this population was partially explained by glycation gap, prediabetes and diabetics respectively. Mean corpuscular volume, mean concentration of haemoglobin, ion levels decreased, while red cell distribution width increased with worsening of HbA1c-based glucose tolerance (all p < 0.0001). Total haemoglobin and all red cell related parameters were similar across OGTT-defined glucose tolerance status. The agreement between OGTT and measured HbA1c in classifying glucose tolerance status was kappa 0.23 (95%CI: 0.17–0.28) overall, 0.10 (0.01–0.20) in anaemic and 0.26 (0.20–0.32) in non-anaemic participants. Equivalent figures after correction for glycation gap using measured fructosamine levels were 0.20 (0.15–0.26), 0.28 (0.15–0.41) and 0.18 (0.12–0.24).

Impact of Body Mass Index on Risk Factors and Target Organ Damage

I. Kyriazis1, M.S. Kallistratos2, L.E. Poulimenos2, A. Groutsis2, N. Kouremenos2, M. Koutsaki2, E.F. Hamodraka2, A.J. Manolis2. 1

PP.18.28 IMPACT OF BODY MASS INDEX ON RISK FACTORS AND TARGET ORGAN DAMAGE

I. Kyriazis1, M.S. Kallistratos2, L.E. Poulimenos2, A. Groutsis2, N. Kouremenos2, A. Koukouzelis2, P. Tsinivizov2, N. Kontogianni2, K. Kifindis2, S. Pagou2, M. Koutsaki2, E.F. Hamodraka2, A.J. Manolis2. 1Pathology department KAT General Hospital, Athens, Greece, 2Cardiology Department, Asklepion General Hospital, Athens, Greece

Objective: To differentiate the sub-clinical impact of body mass index on risk factors, target organ damage, including cardiac adaptations, especially beyond hypertension.

Design and method: In this observational study with a cross-sectional design, 187 patients referred or self-referred to our outpatient institution were prospectively enrolled. In all patients, medical history and physical examination as well as routine biochemical exams, clinic and 24-h blood pressure (BP) evaluation and finally echocardiography was performed.

Results: Patients enrolled were mainly females (55%) aged 51.21 ± 11 years. 38% of the patients were obese while 31% overweight. Body mass index (BMI) was highly related to office and 24-hours blood pressure levels, lipidemic and glucose profile, but not with central BP levels, pulse wave velocity (PWV) and renal function.

More precisely, overweight, obese but also underweight patients had increased mean 24 hours systolic and diastolic BP levels in comparison to normal weight patients (123/75 mmHg, 125/76 mmHg, 128/72 mmHg vs 117/70 mmHg (p < 0.001), higher morning and evening 24 hours mean BP levels (p < 0.001), higher office diastolic BP levels (p < 0.001) without any significant difference in office systolic BP levels, central BP and PWV levels (p = ns). As expected, glucose as well as lipidemic profile was highly related to BMI since the higher the BMI the higher the levels of glucose, LDL abd triglycerides (p < 0.001).

Conclusions: Obese overweight but also underweight patients presents increased cardiovascular risk factors and seems that a J type curve is present.

Clinical Benefits of Using Dapagliflozin as Part of the Combination Therapy in Patients with Arterial Hypertension and Type 2 Diabetes


Objective: The aim was to study an efficacy a combined antihypertensive, antidiabetic and lipid-lowering therapy with inclusion of the member of new class of antidiabetic drugs - inhibitors of sodium-glucose cotransporter type 2 - dapagliflozin in patients with arterial hypertension (AH) with type 2 diabetes (T2D).

Design and method: The patients with hypertension (essential hypertension) in combination with T2D aged 40 to 65 years have been examine. In 29 of the patients (73%) was found abdominal obesity of the first degree, 11 (27%) - overweight. In all patients diagnosed combined dyslipoproteinemia. We determined the body mass index (BMI), total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol, fasting blood glucose levels and glycated hemoglobin. All patients received standard antihypertensive therapy, lipid-lowering therapy included atorvastatin 20 mg in the evening. The first group of the patients (n = 18) as anti-diabetic therapy received metformin (1000–2000 mg/day) with gliclazide (30–60 mg/day), the second group (n = 22) – metformin (1000–2000 mg/day) with dapagliflozin (10 mg).

Results: In the second group compare with the first group observed significantly higher frequency achievement the blood pressure target levels (86% and 78%, respectively), the glyicated hemoglobin target levels (86% and 72%, respectively), significantly greater BMI reduction (p < 0.05) and levels of the blood HDL-cholesterol. The combination of metformin with dapagliflozin unlike the combination of metformin with gliclazide led to a significant reduction in the incidence of hyperuricemia in patients with AH and T2D and abdominal obesity or overweight.

Conclusions: Results of this study indicate the prospects of wider use dapagliflozin as part of antidiabetic therapy, particularly in combination with metfor- min, in patients with hypertension and T2D, especially the course on the background of abdominal obesity or overweight.
POSTER SESSION

POSTERS’ SESSION PS19:
LARGE ARTERIES AND MICROCIRCULATION

PP.19.01 THE POLISH REGISTRY FOR FIBROMUSCULAR DYSPLASIA (ARCADIA-POL STUDY) – EVALUATION OF BLOOD PRESSURE PROFILE AND SUBCLINICAL TARGET ORGAN DAMAGE IN PATIENTS WITH RENAL FMD

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Objective: To evaluate blood pressure (BP) profile and subclinical target organ damage in patients with renal fibromuscular dysplasia (FMD) enrolled into the ARCADIA-POL study.

Design and method: From 144 patients with FMD in any vascular bed enrolled in the ARCADIA-POL study in 2015, we analyzed 127 patients (104F, 23 M, mean age:44.8 ± 15.9 years, range:18–75) with confirmed renal FMD. All patients underwent detailed clinical evaluation including office blood pressure (BP) levels, ABPM, biochemical evaluation, biobanking, duplex Doppler of cervical and abdominal arteries and whole body angio-CT. In all patients left ventricular hypertrophy (LVH) was evaluated in echocardiography according to the current 2013 ESH/ESC guidelines. Patients with arterial damage in patients with renal FMD in any vascular bed enrolled in the ARCADIA-POL study.

Results: When comparing 127 patients with FMD to the matched group of patients with EHT we observed significant differences in office and ambulatory BP levels. The prevalence of resistant hypertension (RHT) and true RHT did not differ between patients with FMD and EHT (16.5% vs 13.8%, p = 0.65; 12.6% vs. 8.2%, p = 0.37). There was also no difference in regards to the dipping status between both groups.

Conclusions: Our results indicate that patients with FMD included into ARCADIA-POL study did not differ from patients with essential hypertension in respect to blood pressure profile and intensity of subclinical target organ damage.

PP.19.02 PULSE WAVE VELOCITY AT REST AND BLOOD PRESSURE DURING EXERCISE – ADDITIVE OR ALTERNATIVE?

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Objective: Blood pressure (BP) during standardized workload has prognostic value with regard to future cardiovascular morbidity and mortality, which is independent of resting BP. Pulse wave velocity (PWV) is a marker of arterial stiffness and known to relate to future cardiovascular risk even after accounting for peripheral BP and other accepted cardiovascular risk factors. Therefore, a study was designed to evaluate the correlation between PWV at rest and peripheral BP at rest and during standardized ergometric testing.

Design and method: In 251 subjects (182 males, 69 females, aged 57.2 ± 13.1 years, BMI 27.4 ± 4.6 kg/m², 152 on antihypertensive medication) PWV was measured non-invasively by Mobil-O-Graph® (24 h PWA Monitor, I.E.M. GmbH, GERMANY). Subsequently, the patients were stressed on a bicycle ergometer under standardized conditions (50–100W, increases 10W/minute). BP was measured with the cuff method at rest before exercise, at workload of 100 watts (BP100W) and 5 minutes after exercise.

Results: Mean PWV at rest was 8.6 ± 1.8 m/sec and correlated significantly (p < 0.01) with the peripheral systolic BP at rest of 132.6 ± 13.9 mmHg (r = 0.26, n = 251).

Independent of BP at rest, there was a clearly stronger correlation between PWV at rest and systolic BP100W of 181.6 ± 21.0 mmHg (p < 0.01, r = 0.41, n = 236).

After 5 minutes of rest after exercise systolic blood pressure was 135.4 ± 14.4 mmHg and correlated significantly with the PWV (p < 0.01, r = 0.25, n = 240).

In subjects with a systolic BP100W ≤ 200 mmHg (n = 50) PWV was 9.6 ± 1.7 m/sec compared to those with a systolic BP100W > 200 mmHg (n = 186) of 8.2 ± 1.6 m/sec. This results in a 16.9% higher PWV (p < 0.01) in the subjects with systolic BP100W above normal.

Conclusions: The results indicate a considerably stronger correlation between PWV at rest and systolic BP during submaximal exercise compared to BP measurements at rest. Whether measuring of PWV at rest is a more comfortable alternative to BP measurement during exercise in terms of diagnosis, therapy monitoring and cardiovascular prognosis, needs further investigation.

PP.19.03 ADVENTITIAL FIBROBLASTS-DERIVED VEGF REGULATES VASA VASORUM NEOVASCULARIZATION CONTRIBUTING TO VASCULAR INFLAMMATION

X. Li, M. Hong, D. Zhu, P. Gao. Shanghai Institute of Hypertension, Shanghai, China

Objective: Vasa vasorum not only supplies oxygen and nutrients to the blood vessel walls, but also plays an essential role in vascular remodeling. This study aims to determine whether adventitial fibroblasts-derived vascular endothelial growth factor (VEGF) regulates vasa vasorum vasoendothelialization which mediates vascular inflammation contributing to vascular remodeling.

Design and method: Balloon injury procedure was performed in male 12-week-old Sprague-Dawley rats. Pluronic gel containing Lucentis, a VEGF inhibitor, was applied to the adventitial surface of injured arteries. Conditioned medium of adventitial fibroblasts was used to stimulate endothelial cells. Rat aortic ring assay was performed to study endothelial sprouting.

Results: Balloon injury induced increased the number of vasa vasorum and neointimal area in adventitia in a time-dependent manner. Interestingly, macrophages were mainly distributed in adventitial vasa vasorum of injured arteries. Increase expression of VEGF was accompanied by endothelial cells proliferation in adventitia. Fluorescence-label macrophages injected into tail vein were recruited into adventitia, especially in vasa vasorum. Furthermore, perivascular delivery of Lucentis preferentially concentrated in the adventitia resulted in a decrease of neointima formation after balloon injury. The effect was preceded by significant reduction of VEGF expression and the number of vasa vasorum with concurrent macrophage infiltration. Conditioned medium of adventitial fibroblasts induced endothelial sprouting which was blocked by soluble fms-like tyrosine kinase-1 (sFlt-1). sFlt-1 also inhibited conditioned medium-activated VEGF-related signaling pathways in endothelial cells. The induction of adhesion molecule by conditioned medium in endothelial cells was suppressed by sFlt-1 which mediates macrophage adhesion.

Conclusions: These results demonstrate that adventitium-derived VEGF plays a significant role in vascular inflammation by regulating vasa vasorum neovascularization and provide insight into VEGF as a potential therapeutic target for vascular diseases.

PP.19.04 CORONARY ARTERY PULSE WAVE VELOCITY: THE MISSING LINK BETWEEN AORTIC STIFFNESS AND CORONARY EVENTS?

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Objective: Albeit of utmost importance, especially with respect to plaque rupture, the biomechanical properties of coronary arteries are poorly assessable in routine practice. A classic method of assessment is to determine vascular compliance through pulse wave velocity (PWV). This has been done for aortic PWV, a strong predictor of coronary artery disease (CAD). To our knowledge, there is no way to assess coronary PWV (CoPWV) in routine practice.

The first objective of this study was to describe a method of measuring coronary PWV (CoPWV) invasively, and to describe its determinants. The second objective was to assess both CoPWV and aortic PWV, in patients presenting with acute coronary syndromes (ACS) or with stable CAD.

Design and method: In fifty-three patients, CoPWV was measured from the delay in pressure wave and distance between the sites of pressure measurement, as a pressure wave was withdrawn from the site to the distal portion of the coronary segment. Pressure and electrocardiographic signals were recorded at a high sampling frequency, and specialized software was used to calculate CoPWV. Similarly, Aortic PWV was measured invasively when the wire was pulled across the ascending aorta; Carotid-femoral PWV was also measured non-invasively using the Sphygmocor system.

Results: Mean CoPWV was 10.3 ± 6.1 m/s. Determinants of increased CoPWV were smoking, diastolic blood pressure, and previous coronary stent implantation in the recorded artery. CoPWV was much lower in ACS versus stable CAD patients (7.6 ± 3 m/s vs. 11.5 ± 6.4 m/s; p = 0.02), and this persisted after adjustment for confounders. On the contrary, aortic stiffness, assessed by AoPWV and by Carotid-femoral PWV, did not significantly differ.

Conclusions: CoPWV seems associated with acute coronary events more tightly than AoPWV. Low coronary compliance, whether per se or because it leads to a distal shift in compliance mismatch, may expose vulnerable plaques to high cyclic stretch. CoPWV is a new tool to assess local compliance at the coronary level; it paves the way for a new field of research.
Objective: Capillary rarefaction is increasingly believed to play a pivotal role in the pathogenesis of end-organ damage by affecting pressure and blood flow patterns. This severely affects peripheral vascular resistance (and thereby on systemic blood pressure), metabolisms and notably promotes tissue ischemia. We investigated retinal capillary density in patients with early disease of hypertension, diabetes mellitus type 2 (T2DM) and compared our results to healthy individuals.

Design and method: This cross-sectional study compares capillary rarefaction determined by intercapillary distance (ICD) and capillary area (CapA), measured non-invasively and in vivo by using scanning laser Doppler flowmetry, in 134 individuals with hypertension stage 1 or 2, 73 patients with non-insulin requiring T2DM and 55 healthy controls.

Results: Compared to hypertensive patients, diabetic individuals showed no difference in ICD (23.2 ± 5.5 vs 23.1 ± 5.8, p = 0.781) and CapA (1592 ± 595 vs 1556 ± 649, p = 0.768) after adjustment for differences in cardiovascular risk factors between the groups. In patients with T2DM, ICD was greater (23.2 ± 5.5 vs 20.2 ± 4.2, p = 0.013) and CapA smaller (1592 ± 595 vs 1821 ± 652, p = 0.019) than in healthy controls. Diabetic patients were separated in 40 patients with hypertension and well controlled blood pressure and 33 patients without hypertension. There was no significant difference in ICD (22.9 ± 5.6 vs 23.5 ± 5.5, p = 0.647) and CapA (1583 ± 566 vs 1600 ± 638, p = 0.901) between diabetic patients with hypertension compared to diabetic patients without hypertension.

Conclusions: There was no difference in capillary rarefaction in patients with hypertension and patients in the early stage of T2DM. Patients with T2DM showed capillary rarefaction compared to healthy individuals.

PP.19.09
CENTRAL AORTIC SYSTOLIC BLOOD PRESSURE CAN PREDICT PROLONGED QRS DURATION BETTER THAN BRACHIAL ARTERY SYSTOLIC BLOOD PRESSURE

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Objective: Many studies suggested that central aortic systolic blood pressure (CASP) has been shown to be a stronger predictor of target-organ damage and cardiovascular events than brachial systolic blood pressure (BSBP), but there was no dating about whether CASP can predict prolonged QRS duration more than BSBP. We examined the association of CASP and BSBP with QRS duration in rural community residents.

Design and method: This was a retrospective study. A total of 490 rural community residents were all from the Liaobu town, Guangdong, China, which a community cohort was managed by Guangdong general hospital. All participants underwent physical examinations, regular laboratory examinations, standard resting 12-lead ECG, and noninvasive CABP measurements. Linear regression was assessed the associations of QRS duration with clinical conditions. Logistic regression analyses were performed to determine the independent predictor of prolonged QRS duration. Receiver operating characteristic (ROC) curve was used to evaluate the utility of CASP for prolonged QRS duration.

Results: We retrospectively analyzed 490 rural community residents who all of them CASP, BSBP and standard resting 12-lead electrocardiogram were measured. The prolonged QRS duration group showed higher CASP (139.38 ± 11.67 vs 135.36 ± 16.22, P = 0.031) and BSBP (136.03 ± 6.74 vs 124.44 ± 13.01, P < 0.001) as compared with controls. Multivariate linear regression analysis showed that CASP: BSBP and heart rate were independently affecting QRS duration. Logistic regression analyses showed that CASP (OR 1.057, 95%CI: 1.027, 1.088, P < 0.001) and BSBP (OR 1.056, 95%CI: 1.027, 1.086, P = 0.032) were independent predictors of prolonged QRS duration after adjustment for age, sex, blood mass index, heart rate. CASP had a better predictive value for prolonged QRS duration than BSBP (AUC: 0.793 vs 0.601, P < 0.001).

Conclusions: Our findings showed that both CASP and BSBP were risks for prolonged QRS duration, but CASP can better predict prolonged QRS duration more than BSBP.

PP.19.10
THE ARCADIA-POL STUDY—INVOLVEMENT OF CERVICAL AND INTRACRANIAL ARTERIES IN RELATION TO VASCULAR COMPLICATIONS AND ASSOCIATED CLINICAL SYMPTOMS IN PATIENTS WITH RENAL FMD

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Objective: To assess the involvement of cervical and intracranial arteries and associated clinical symptoms in patients with renal fibromuscular dysplasia (FMD) enrolled into ARCADIA-POL study.

Design and method: From 144 patients with confirmed FMD enrolled into ARCADIA-POL study in 2015, 127 patients (104F, 23 M, mean age: 44.8 ± 15.9 years) were analyzed. All patients underwent clinical evaluation: ABPM, biochemical evaluation, biobanking, duplex Doppler of cervical and abdominal arteries and whole body angio-CT including cervical and intracranial arteries.

Results: Among 127 patients with renal FMD, 31(24.4%) had coexisting FMD lesions in cervical and/or intracranial arteries and/or intracranial aneurysms: 15(11.8%) pts in carotid, 4(3.1%) pts in vertebral and 19(15.0%) pts in intracranial arteries. Dissections of carotid arteries were found in 4(3.2%) pts and vertebral artery dissections in 3(2.4%) pts. In 3(2.4%) pts internal carotid artery aneurysm was found. 12(9.5%) pts had intracranial aneurysms: 9(7.1%) pts had one aneurysm, 2(1.6%) pts 2 aneurysms, 1(0.8%) pts 3 aneurysms and 1(0.8%) pt 4 intracranial aneurysms. Patients with and without cervical and/or intracranial FMD lesions didn’t differ in terms of age, gender, clinical and ambulatory blood pressure levels, hypertension prevalence and number of antihypertensive medications. There was also no difference in the incidence of cervical and/or intracranial FMD lesions in patients with multifocal and unifocal lesions in renal arteries. There were no significant differences in the prevalence of symptoms such as headaches, tinnitus, dizziness and cervical bruits between the patients. There was only a significant difference in the presence of Horner’s syndrome between patients with and without cervical and/or intracranial FMD (12.9% vs 2.4%; p = 0.017, respectively).

Conclusions: There were no specific clinical features suggesting the presence of FMD lesions and vascular complications in cervical and/or intracranial arteries in patients with confirmed renal FMD included into ARCADIA-POL STUDY. Our study showed that systematic evaluation of cervical and intracranial arteries in
patients with renal FMD resulted in revealing relatively high prevalence of FMD lesions and vascular complications in cerebral and/or intracranial arteries.

**Objective:** An important area of interest in arterial wave pulse analysis is the quantification of arterial wave reflection. It can be achieved by wave separation analysis (WSA) if both the aortic pressure waveform and the aortic flow waveform are known. For better applicability, several mathematical models have been established to estimate aortic flow solely based on pressure waveforms. The aim of this study is to investigate and verify the model based wave separation of the ARCSolver method on virtual pulse wave measurements.

**Results:** The investigated parameters showed a good overall agreement between the model based method and the reference, see table. Mean differences and standard deviations were -0.05 ± 0.02 AU for characteristic impedance, -3.93 ± 1.79 mmHg for forward pressure amplitude, 1.37 ± 1.56 mmHg for backward pressure amplitude and 12.42 ± 4.88 % for reflection magnitude.

**Conclusions:** The results indicate that the mathematical flow model of the ARCSolver method is a feasible surrogate for a measured flow waveform and provides a reasonable way to assess arterial wave reflection non-invasively.

**Virtual Database**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean ± STD</th>
<th>ARCSolver</th>
<th>Difference</th>
<th>Mean ± STD</th>
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<tr>
<td>AM (%)</td>
<td>65.62 ± 6.65</td>
<td>78.04 ± 5.57</td>
<td>12.42 ± 4.88</td>
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</tbody>
</table>

**Zc:** characteristic impedance, **Pf:** forward pressure wave amplitude, **Pr:** backward pressure wave amplitude, **AM:** reflection magnitude

**PP.19.12 ASSOCIATION OF ISOLATED MORNING HYpertension WITH ARTERIAL MEASURES IN UNtREATED CHINESE PATIENTS**

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**Objective:** Morning hypertension was suggested to be closely associated with target organ damage and cardiovascular events. However, the independent contribution of morning hypertension to cardiovascular damage remains controversial. The purpose of our study was to investigate the association of isolated morning hypertension with measures of arterial stiffness and microalbuminuria in an untreated outpatient cohort.

**Design and method:** We recruited consecutive outpatients who were suspected of having hypertension but not taking antihypertensive drugs for at least 2 weeks and referred to our hypertension clinic from November 2010 to June 2015. Home BP was self-measured with the Omron 7051 monitors for 7 days. Hypertension was defined as a mean home BP of at least 135/85 mmHg either in the morning or in the evening. We assessed carotid-femoral pulse velocity (cPWV) and central augmentation index (cAIx) with the Sphygmocor system as measures of arterial stiffness, and the morning urinary albumin/creatinine ratio (ACR) as measures of microalbuminuria.

**Results:** In the 1357 untreated outpatients (mean age, 51.0 years; women, 51.9%), 200 (13.0%) had isolated morning hypertension. Patients with isolated morning hypertension compared to normotensive subjects had faster cPWV (8.1 vs 7.5 mm/s, P = 0.001), increased cAIx (0.57 vs 0.56 mmHg, P = 0.049), but similar cAIx (26.7 vs 25.3%, P = 0.14). After adjustment for age, sex, body height and weight, heart rate, current smoking and alcohol intake, serum total cholesterol and fasting glucose, the between-group difference in cPWV (8.0 vs 7.5 mm/s, P < 0.001), cAIx (25.8 vs 23.5%, P < 0.001) and ACR (0.72 vs 0.62, P = 0.037) were statistically significant. In continuous analysis, home morning systolic BP was significantly (P < 0.001) associated with cPWV and ACR after adjustment with aforementioned variables and evening SBP. In addition, for cPWV and ACR, morning systolic BP explains the greatest part of the variations in the model.

**Conclusions:** The prevalence of isolated morning hypertension is 13% in our untreated Chinese outpatients. Isolated morning hypertension is associated with arterial stiffness and increased wave reflections in untreated Chinese patients. Home morning BP was independently associated with arterial damage.
Results: Mean values of ABSI (0.083 ± 0.001), CAVI (8.8 ± 1.2), and IMT (0.738 ± 0.093), were higher in males. ABSI was positively associated with CAVI, baPWV and with average mean IMT after adjusting for confounders. Thus, for each unit increase in ABSI, CAVI increased by 0.12 units, baPWV by 0.21 m/sec, and IMT by 0.037 mm. In the logistic regression analysis, the OR of the ABSI was >1 for high CAVI >9, baPWV >15 m/sec and IMT >0.90 mm, in the overall subject, and by sex and age (>62, < 62 years), after adjusting for confounders.

Conclusions: ABSI shows a positive association with vascular structure and function, which is independent of BMI and other confounders that may influence weight and fat mass distribution in Caucasian subjects at intermediate cardiovascular risk.

Design and method: Adaptive Optics RTX® Camera (ImagineEye, Orsay, France) was used to measure Wall Thickness (WT), Internal Diameter (ID) and to calculate Wall Cross Sectional Area (WCSA) and Wall-to-Lumen Ratio (WLR) on retinal arterioles of patients with acromegaly. As IGF1 is gender and age-dependent, an IGF1/normal value ratio (IGFR1) was generated for each patient. Acromegaly patients were then stratified according to their IGF1r: patients with IGF1r > 1 were defined as uncontrolled, patients with IGF1r < 1 as defined as having controlled acromegaly. Moreover, non-acromegaly control subjects matched for age/gender/diabetes/blood pressure levels and antihypertensive treatment were also recruited.

Results: 80 patients and controls were recruited. Mean age was 51 ± 12 years and 54% were men. Subjects with uncontrolled acromegaly exhibited hypertrophic remodeling with increased WLR, WT and WCSA compared to both controlled patients and control subjects (Table).

No differences in ID were found between controls and patients with controlled acromegaly. Mean IGF1r was higher in uncontrolled subjects compared to subjects with controlled acromegaly (1.3 ± 0.46 vs 0.72 ± 0.18, p < 0.001). Moreover, IGF1r value was positively associated to WLR (r² = 0.3, p < 0.001) and negatively to lumen (r² = 0.1, p = 0.02) while there was a trend towards a positive association with WCSA and WT.

Conclusions: Subjects with uncontrolled acromegaly exhibit hypertrophic arteriolar retinal remodeling associated with IGF1 levels increase. Normal retinal arteriolar anatomy has been found in patients with a controlled disease suggesting a potential reverse remodeling under treatment.

Aortic CSA remodeling in uncontrolled acromegaly

No significant changes were observed in other retinal parameters or in SSVRI although vasodilator drugs were used.

Conclusions: Retinal arteriolar lumen dilatation was observed after short-term brachial BP reduction, and was not related to TPR decrease.

At follow-up, a significant decrease in SBP was observed (-13 ± 7.5% p = 0.008) in association with a significant lumen dilatation of retinal arterioles (+11.6 ± 7.6%, p = 0.018).

No significant changes were observed in other retinal parameters or in SSVR although vasodilator drugs were used.

Conclusions: Retinal arteriolar lumen dilatation was observed after short-term brachial BP reduction, and was not related to TPR decrease.

This suggests that 1) the changes in retinal arteriolar network may be more easily detected than TPR changes, and/or that 2) lumen dilatation or retinal arteriolar changes occur to a greater extent than at the peripheral level.

Objective: A decreased aortic reservoir function is associated with increased cardiovascular events. Patients with chronic kidney disease in need of dialysis have an accelerated progression of aortic stiffness and reversal of the aortic-to-brachial stiffness gradient. We previously observed an annual reduction in brachial stiffness which was partly explained by a greater stiffness of the aorta. The aim of this study was to determine the relationship between aortic reservoir pressure, regional arterial stiffness and aortic-to-brachial stiffness gradient.

Design and method: Among 310 patients with chronic kidney disease on dialysis, an accelerated progression of aortic stiffness and reversal of the aortic-to-brachial stiffness gradient. We previously observed an annual reduction in brachial stiffness which was partly explained by a greater stiffness of the aorta. The aim of this study was to determine the relationship between aortic reservoir pressure, regional arterial stiffness and aortic-to-brachial stiffness gradient.

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Results: Reservoir pressure parameters were significantly associated with cf-PWV (stdz β of RP = 0.194, stdz β of AUC-RP = 0.168) and PWV ratio (stdz β of RP = 0.283, stdz β of AUC-RP = 0.310) in multivariate models taking into account mean arterial pressure, age, sex, hemodialysis status, diabetes, height and heart rate, all with p < 0.001. An inverse association was observed in multivariate models between reservoir pressure and cf-PWV (stdz β of RP = 0.153, stdz β of AUC-RP = −0.221). In contrast, excess pressure parameters were not significantly associated with regional stiffness and PWV ratio in multivariable models.

Conclusions: In a dialysis population, aortic reservoir function was associated with aortic stiffness and PWV ratio and negatively associated with brachial stiffness in multivariate models. In contrast, no association was observed between excess pressure parameters and PWV after adjustments for potential confounders.

PP.19.18 ASSOCIATION OF ARTERIOSCLEROSIS AND/OR ATHEROSCLEROSIS WITH HYPERTENSIVE TARGET ORGAN DAMAGES IN THE COMMUNITY-DWELLING ELDERLY CHINESE: THE NORTHERN SHANGHAI STUDY

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Objective: Cardiovascular events and mortality are tightly associated with vascular abnormalities. There are two types of modifications in vascular structure, namely arteriosclerosis and atherosclerosis, which coexist in many patients with cardiovascular diseases. However, it remains unclear whether their combination may lead to worse status in those patients. We therefore aimed to investigate the association of arteriosclerosis and/or atherosclerosis with hypertensive target organ damages (TODs), within a framework of cardiovascular risk assessment in a community-dwelling elderly cohort.

Design and method: From June 2014 to August 2015, a total of 1599 community-dwelling elderly subjects (age >65 years old) located in the northern Shanghai were recruited. Vascular measurements, such as carotid-femoral pulse wave velocity (cf-PWV), ankle-brachial index (ABI) and carotid plaque, were conducted on each participant, and arteriosclerosis was defined as cf-PWV>12 m/s, while atherosclerosis was defined as ABI < 0.9. Within the framework of comprehensive cardiovascular examinations, risk factors were assessed, and asymptomatic TODs were evaluated by measuring participants’ left ventricular mass index (LVMi), peak transmural pulsed Doppler velocity / early diastolic tissue Doppler velocity (E/Ea), urinary albumine-creatinine rate (UACR), evaluate glomerular filtration rate (eGFR).

Results: Among hypertensive target organ damages (TODs), LVH was significantly associated with E/Ea and only E/Ea significantly differed among participants with or without arteriosclerosis and/or atherosclerosis (P for trend < 0.02), in full adjustment model, only E/Ea significantly differed among subjects with or without arteriosclerosis and/or atherosclerosis (P for trend = 0.023). Moreover, E/Ea was significantly different between participants with arteriosclerosis or atherosclerosis and those without (P = 0.045), while there was no significant difference between participants with arteriosclerosis and atherosclerosis and those without (P = 0.28). Similar results were obtained in the multivariate logistic regression of left ventricular diastolic dysfunction (LVDD). With similar adjustment, LVDD was significantly associated with arteriosclerosis (P = 0.01) but not with atherosclerosis (P = 0.99).

Conclusions: In the community-dwelling elderly Chinese, among hypertensive target organ damages, LVDD was significantly associated with atherosclerosis but not with arteriosclerosis, and their combination does not worsen patients’ LV diastolic function.

PP.19.19 ANGIOLOGIC SCREENING OF YOUNG POPULATION IN SOUTH REGION OF RUSSIA: EXPERIENCE WITH CARDIO-ANKLE INDEX

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Objective: Conduction of mass estimate of the parameters of vascular stiffness of students, taking into account gender in university preventive project.

Design and method: It was achieved survey of 175 students on basis of student’s health Center of SSMU within the project The University - Health Area. It was analyzed occurrence of five main RF (burdened heredity, overweight, smoking, obesity, stress) and assessment of state of the vascular wall in terms of Cardio-Ankle Vascular Index (CAVI) with the help of software-diagnostic system VaSera-1500 (Fukuda Denki, Japan). Groups formed by sex. We carried out step by step analysis of each of these groups in the aspect of the distribution of boys and girls through the levels CAVI values. Data processed by Statistica analysis package.

Results: It was found CAVI among boys more than girls in average 0.1–0.2, minimum 0.2–0.3 and maximum 0.3–0.4 on different hands. Moreover, these parameters on left side somewhat higher than the right. It turned out that in range of studied index above 6.5 was placed boys in terms of R-CA VI 16.5%, and girls in terms of L-CA VI 20%, and girls in terms of R-CA VI 8.4% and L-CA VI 20.3 %, respectively. For young men 95 percentile was R-CAVI 7.1 and L-CAVI 7.2, and for girls R-CAVI 6.8 and L-CAVI 7.0 respectively. The average number of risk factors studied in groups of boys and girls with L-CAVI above 6.5 was in the 2.2 and 1.8-fold higher compared with those carriers of lower values of the studied parameter. At the same time blood pressure in these groups did not differ significantly.

Conclusions: Both among boys and among girls left index CAVI is slightly higher than the right. Indicator Kavi probably less than 6.5 may be considered as admissible norm for people in this age category. The most significant in terms of asymmetry was observed in women - almost three times. Carriers of high level of CA VI have number of risk factors more significant than the other surveyed boys and girls. These data tools helpful to consider the formation of individual programs in-depth preventive intervention among young people.

PP.19.21 ASSOCIATION BETWEEN QTC AND VASCULAR STIFFNESS

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Objective: QTc prolongation is associated with hypertension, insulin resistance, body mass index increase (BMI), left ventricular hypertrophy, female gender, and subclinical atherosclerosis. Among hypertensives an increased arterial stiffness is considered as a subclinical target organ damage. Our hypothesis was that a direct association between QT interval duration and arterial stiffness could be identified suggesting their interaction towards a higher cardiovascular risk.

a) To evaluate the distribution of corrected QTc duration in hypertensive patients (HP) in comparison with a control group and b) to determine the association between QTc and vascular stiffness in the general population.

Design and method: The study included 53 patients considered as general population, and then classified as hypertensive (n: 30), and normotensive (n:23), age: 55.13±10.94 years, male: 34, female:19. Arterial pressure, vascular stiffness, index of left ventricular mass (LVMi) and QTc interval were measured. Patients were divided in tertiles according to the QTc duration: T1 QTc 350–400 msec, T2 QTc 400–439 msec and T3 QTc > 440 msec.
Results: No major differences were observed between the hypertensive patients group and the control group in terms of age (p = 0.0873), gender (p = 0.6142), diabetes (p = 0.8721), sedentary lifestyle (p = 0.0650), and smoking (p = 0.9121). Difference was observed in systolic blood pressure (SBP), p = 0.00365; diastolic blood pressure (DBP) p = 0.001 and QTc (406.10 ± 29.6 versus 391.76 ± 21.1, p = 0.0345).

The QTc correlated in univariate form with PWV (p = 0.0050) and with SBP (p = 0.0328). When making a multivariate analysis the association between PWV and QTc remained unchanged (p = 0.0232). The AUC was 0.686 (p = 0.0154), with a 83.3% sensitivity, 58.54% specificity and a cut point of 402 mseg for QTc as predictor of vascular stiffness increase.

Conclusions: The QTc values were more prolonged in hypertensive patients. Furthermore, a direct association between QTc length and arterial stiffness was observed.

**PP.19.22 VALIDATION OF A NEW CENTRAL AORTIC PRESSURE MEASUREMENT EQUIPMENT AORTIC COMPARED WITH SPHYGMOCOR**

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Objective: To validate a new non-invasive Central Aortic Pressure (PAC) equipment by Aortic radial tonometry compared to Sphygmocor.

Design and method: Subjects from 18 to 80 year old, stratified into 3 groups: < 30, 30–60, > 60 years with equal number of hypertensive and healthy volunteers in each stratum. Exclusion criteria: BMI>30 Kg/m2, pregnancy, arrhythmias, wrist surgery or alterations that prevented radial pulse measurement. Anthropometric measurements were performed, the brachial blood pressure (BP) was measured in triplicate, so standardized with automatic device (OMROM HIEM 705CP). Three measurements of the PAC were performed with the Aortic equipment (PAC)ort and 3 with the Sphygmocor (PACsphyg) alternately, on the right side, without previous consumption of alcohol and coffee. Statistical analysis: Bland-Altman method to evaluate the degree of agreement between the measurements of both devices. The recommendations of the American Association for the Advancement of Medical Instruments (AAMI) were considered for the assessment of the degree of agreement: mean differences < 5 mmHg and standard deviation < 8 mmHg. Protocol approved by the institutional ethics committee. The study was carried out independently and for academic purposes.

**PP.19.23 LACK OF AN ASSOCIATION BETWEEN LOW PLASMA VITAMIN D AND CAROTID ARTERY STIFFNESS IN HYPERTENSION**

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Objective: Recent studies suggest an association between vitamin D deficiency and prevalence of cardiovascular disease in the general population. However, the evidence of a relationship between vitamin D status and vascular functional changes in hypertension is currently controversial. We aimed to investigate if the presence of low serum vitamin D levels is associated with an increased arterial stiffness in essential hypertension.

Design and method: In 151 essential hypertensive patients (53 ± 13 y, 71 males) we measured serum 25(OH)-vitamin D levels and performed a carotid ultrasound examination to determine variables of carotid stiffness, such as distensibility, compliance, Young elastic modulus and beta-stiffness. Furthermore, in a subgroup of 86 subjects we evaluated the augmentation index and the pulse wave velocity. The patients were subdivided into two groups according to the 25(OH)-vitamin D levels, lower or higher than 30 nmol/L.

Results: A plasma vitamin D level lower than 30 nmol/L was found in 83 (55%) of 151 patients. Patients with low vitamin D levels were significantly older than those with a normal value of serum vitamin D. No significant differences in carotid artery distensibility, compliance, Young elastic modulus, and beta-stiffness were observed between patients with plasma vitamin D below or above 30 nmol/L. Also, the augmentation index and the pulse wave velocity were comparable in hypertensive patients with lower or higher plasma vitamin D levels.

Conclusions: This study does not support the hypothesis of an association between vitamin D deficiency and functional vascular changes in hypertensive patients.

**PP.19.24 DETERMINANTS OF INAPPROPRIATELY HIGH PULSE WAVE VELOCITY IN HYPERTENSIVE PATIENTS: A RETROSPECTIVE CROSS-SECTIONAL COHORT STUDY**

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Objective: Age and blood pressure (BP) are known to be the main determinants of large artery stiffness. However other factors may lead to an inappropriately high pulse wave velocity (PWV) on top of these two factors. We investigated the determinants of inappropriately high PWV in hypertensive patients, and their possible role in causing organ damage accrual.

Design and method: Hypertensive patients were selected among those attending a visit in our Hypertension Outpatient Clinic and undergoing carotid-femoral PWV by applanation tonometry, and cardiac and carotid ultrasound during a 5-year period (2006–2011). Inappropriately high pulse wave velocity (PWV) was calculated as the ratio between the observed value and the values predicted according to the formula derived from international reference values stratified by age and mean BP (oPWV/pPWV).

Results: 731 hypertensive patients were selected (age 30–88 years, 42% women, 57% taking BP-lowering drugs). Median oPWV/pPWV was 102% (range 61–196%). In a multiple linear regression model, independent determinants of oPWV/pPWV were: daylight hours (beta = -1.72, p < 0.001), age (beta = -0.73, p < 0.001), BMI (beta = 0.49, p = 0.01), blood glucose (beta = 0.18, p < 0.001), mean BP (beta = -0.25, p = 0.002) and heart rate (beta = 0.22, p = 0.003). Though oPWV/pPWV was significantly higher in men and current smokers, the association disappeared in the multiple regression model. There was no association between oPWV/pPWV and any BP-lowering drug class. oPWV/pPWV was not associated with left ventricular mass. Conversely, oPWV/pPWV was an independent determinant of the presence of carotid plaques (beta 7.35, 5–95%CL 2.36–12.34).
Conclusions: In hypertensive patients, inappropriately elevated PWV is associated more tightly than observed PWV to younger ages and high blood glucose, thus it might help to better depict vascular aging in younger hypertensives and in those with metabolic alterations. A more advanced atherosclerotic process might also contribute to excess aortic stiffness. Whether an inappropriately high PWV translates into an increased cardiovascular risk should be determined in longitudinal studies.

PP.19.25 INCREASED CENTRAL PRESSURE AUGMENTATION IS ASSOCIATED WITH REDUCED SLEEP DURATION IN INDIVIDUALS EXPOSED TO AIRCRAFT NOISE POLLUTION: THE SERA-CV STUDY
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Objective: Exposure to environmental noise might exert negative effects on cardiovascular function. Aim of the study is to explore whether sleep loss associated with exposure to aircraft noise has a detrimental effect on vascular function.

Design and method: 22 individuals, heavily exposed (E) to aircraft noise (>50 Dba) were recruited and matched with a group of non-exposed individuals (NE). Pulse wave velocity (PWV), central blood pressure (BP), augmented pressure (AP) and augmentation index (Aix) were performed. 7-day actigraphy was performed for the assessment of total sleep time (TST) and wake after sleep onset (WASO).

Results: E showed similar TST (7.2 ± 1.8 vs 7.1 ± 1.3 h, p = 0.77) and WASO (50 ± 46 vs 47 ± 30 min, p = 0.49) compared to NE. E showed higher Aix (26 ± 12 vs 14 ± 16, p = 0.006) and AP (11 ± 7 vs 7 ± 8, p = 0.03) than NE, in the presence of similar PWV, mean BP and heart rate (HR).

In E group, Aix was related with height (r = -0.56, p = 0.009), TST (r = -0.65, p = 0.002), while it was not related with age, mean BP PWV and HR. The association remained significant in a multiple regression model (beta = -2.92, p = 0.01), while was not related with age, mean BP, PWV and HR. The association remained significant in a multiple regression model (beta = -2.92, p = 0.01), with slightly greater variance. Pending noninvasive validation using brachial sphygmonanometry techniques, the AN model provides plausible aortic SBP estimation without waveform analysis, allowing potential inclusion in conventional brachial sphygmonanometer devices.

Conclusions: Central pressure augmentation is independently affected by sleep duration in individuals exposed to high levels of environmental aircraft noise.

PP.19.26 PULSE WAVE SPEED - A METHOD IN MONITORING OF HYPERTENSION IN CLINICAL PRACTICE
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Objective: This work aims to demonstrate the relationship between Pulse Wave Velocity (PWV) and central Aortic pressure (PaO) in the office of the patients, since it expresses the relationship between stiffness, elasticity and arterial compliance.

Design and method: The study was carried out from the data collection of the Instituto of Cardiovascular Diseases of Rio Preto and State College of Medicine São José do Rio Preto – Sao Paulo - Brazil. We evaluated 123 patients receiving their treatment, of which 98 males and 25 females, which in turn were subjected to evaluation of computerized automatic Sphygmocor® (Model - IN 3, Australia - Atcor Medical Pty Ltd) avalando- is the pulse wave velocity (PWV), Aorta pressure (PaO). Patients were analyzed and not with high blood pressure (HAS), coronary artery disease (CAD) and diabetes (DM).

Results: After analysis of the results from the Pearson correlation coefficient (r) and Spearman (p), we can conclude that there was a weak correlation, but positive (r = 0.2237) and significant between Hypertension and pulse wave velocity (PWV) (p = 0.01); weak correlation, but positive (r = 0.2200) and significant between Coronary Artery Disease (CAD) and age (p = 0.0145); weak correlation, but positive (r = 0.1814) and significantly between diabetes and VOP (P = 0.0447), and weak correlation (r = 0.02760), but significant between CAD and VOP (p = 0.7614).

Conclusions: Therefore, the analysis of pulse wave velocity (PWV) and central aorta pressure (PaO) has been presented as simple diagnostic method, non-invasive and sensitive for assessing arterial stiffness. It is set thus, the importance of identifying individuals at high risk for such changes and to determine appropriate therapeutic intervention.

PP.19.27 APPLICATION OF NEURAL NETWORKS FOR ESTIMATION OF AORTIC SYSTOLIC PRESSURE FROM PERIPHERAL SYSTOLIC AND DIASTOLIC PRESSURE
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Objective: Methods for estimation of aortic systolic blood pressure (SBP) require recording of a peripheral pressure waveform, which requires specialized devices for brachial volumetric or radial tonometric pulse measurement. This study investigates the possibility of aortic SBP estimation from peripheral SBP and diastolic blood pressure (DBP) using artificial neural networks (ANN) with (ANN)SBP,DBP,HR) and without (ANN)SBP,DBP) heart rate (HR). These parameters were investigated as they are readily available in conventional brachial sphygmonanometry. As a proof of concept and to remove measurement error, the theory was investigated using invasive measurements of blood pressure.

Design and method: Ten-fold cross validation was applied to invasive, simultaneously recorded aortic and radial pressure during rest and vasodilation following nitroglycerin (6 g/kg/min) infusion in subjects (n = 62) drawn from a patient cohort previously reported. The results of the ANN models were compared to an ANN model using additional waveform features (ANNWaveform), to an N-point moving average method (NPMA) and to an existing, validated generalized transfer function (GTF).

Results: Estimated aortic SBP for all methods was on average < 1 mmHg different to measured aortic SBP with the exception of NPMA (difference 2.0 ± 3.5 mmHg, p = 0.62). Variability of the difference was significantly greater in [ANN]SBP,DBP,HR) and [ANN]SBP,DBP) (both S.D. of ± 5.9 mmHg, p = 0.001) compared to the GTF method, ± 4.0 mmHg, p = 0.001. Inclusion of waveform features decreased the variability (ANNWaveform ± 3.9 mmHg, p = 0.264). Estimated aortic SBP in all models was correlated with measured SBP, with ANN models providing statistically similar results to the GTF method, only the NPMA being statistically different (p = 0.031).

Conclusions: These findings indicate that ANN applied to peripheral SBP, DBP and HR alone can provide aortic SBP estimation comparable to the GTF, albeit with slightly greater variance. Pending noninvasive validation using brachial sphygmonanometry techniques, the ANN method provides plausible aortic SBP estimation without waveform analysis, allowing potential inclusion in conventional brachial sphygmonanometer devices.

PP.19.28 DETECTION OF RETINAL MICROVASCULAR ALTERATIONS IN RHEUMATOID ARTHRITIS PATIENTS WITHOUT CARDIOVASCULAR DISEASES
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Objective: Quantitative evaluation of the retinal vasculature using the nonmydriatic fundus camera is gaining increasing attention as an early, subclinical indicator of cardiovascular risk. Subtle alterations of the retinal vessels have been consistently observed in populations with cardiovascular diseases. However, it has not been investigated whether the retinal microvasculature is affected in patients with autoimmune rheumatic diseases, who are typically perceived as a high-cardiovascular risk population, in the absence of established cardiovascular disease.

Design and method: Consecutive patients with rheumatoid arthritis were recruited from the Rheumatology Outpatient Unit of our Department and were matched with healthy, non-treated volunteers for the purposes of the study. Patients were free from cardiovascular comorbidities including high blood pressure, diabetes mellitus, heart diseases and stroke. All participants underwent fundus photography with a non mydriatic NIDEK AFC-230/210 camera. Semi-automated software was developed to calculate central retinal arteriolar equivalent (CRAE) and central retinal venular equivalent (CRVE), as well as the retinal arteriovenous ratio (AVR).

Results: A total of 28 patients with rheumatoid arthritis and 32 controls aged 57.1 ± 10.9 years were included in the study. Patients were matched with controls in terms of age, gender, systolic/diastolic blood pressure and cholesterol levels (p>0.05 for all). Patients exhibited significantly lower CRAE compared to controls (81.1 ± 10.0 vs 92.9 ± 8.3, p = 0.001), and the same was observed with AVR (0.70 ± 0.09 vs 0.83 ± 0.08, p = 0.001). CRVE was comparable between patients and controls (117.2 ± 15.4 vs 112.7 ± 11.2, p = 0.204).
**PP.19.29 DETERMINANTS OF EARLY VASCULAR AGEING: A MULTIVARIATE ANALYSIS**

C. Antza1, I. Doundoulakis2, S. Stabouli3, V. Kotsis1. 1382 apparently healthy participants aged 25–65 years were randomly selected from Saint-Petersburg inhabitants (a sample form ESSE-RF study). All participants signed informed consent. Fasting lipids, glucose and BP measurement were performed. All patients were divided into low (<1%), intermediate (1–5%), high (5–10%) and very high (>10%) cardiovascular risk groups according to SCORE. 191 participants were excluded from the risk estimation due to presence of cardiovascular complications. Cardio-ankle vascular index (CAVI), carotid-femoral pulse wave velocity (cfPWV-V) and ankle brachial index (ABI) were measured by VaSera VS-1500, carotid-femoral pulse wave velocity (cfPWV-S) was detected by Sphygmocor only in 452 participants due to technical problems. Measurement of intima-media thickness (IMT) was performed by My Sono U6. The subclinical organ damage was detected, if cfPWV-V or cfPWV-S was >10m/s, CAVI > 9,0, ABI <= 0,9, IMT>0,9 mm. Statistical analysis was performed using SPSS Statistics 20.

**Results:** Most of patients 955 (76,7%) did not have subclinical vascular damage by any of methods. The subclinical vascular damage detected by IMT assessment was found out significantly more often (212 (24,7%)) in comparison with CAVI (75 (8,7%)) and ABI (18 (2,1%)) assessment. p < 0,005. Significant correlations of the SCORE logarithm with IMT (r = 0,61, p = 0,0001) and cfPWV-Vs (r = 0,38, p < 0,001) were revealed. Logical trend of growing CAVI in proportion to increase of SCORE risk level was observed, but it did not come up to significant level (r = 0,35, p = 0,14). ABI and cfPW-V-V increasing was not associated with the growing level of cardiovascular risk.

**Conclusions:** The number of subclinical vascular damage participants detected by IMT and cfPW-V-V assessment increases in proportion to the growing level of cardiovascular risk according to SCORE. IMT and cfPW-V-V might be considered as additional risk markers in cardiovascular risk stratification.

**PP.19.30 ULTRASOUND ASSESSMENT OF AORTIC STIFFNESS IN HYPERTENSIIVE PATIENTS WITH TAKAYASU AORTARTERITIS**

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**Objective:** Analysis of aortic stiffness using ultrasound-based technique in Takayasu arteritis (TAA) patients with different inflammatory disease activity.

**Design and method:** We studied 23 patients with TAA, all female, at the age of 39±(34±55) years and 34 healthy volunteers from the control group (15, men, 19 women) at the age of 43±(37±46) years. Pulse wave velocity in the aorta (aPWV) and local stiffness (stiffness index b) of the abdominal (AA) and thoracic aorta (TA) were measured by ultrasound method in all studied. High sensitive C-reactive protein (hsCRP) and erythrocyte sedimentation rate (ESR) were determined to assess disease activity.

**Results:** We found a significant increase of aPWV 3.7(7.6;11.1)m/s in TAA patients compared to the control group 5.2(4.8;5.5)m/s, p < 0.0001. Local stiffness for bTA was significantly increased 11.8(7.3;20), in comparison with the control group 8.7(5.5;14.9) m/s compared to 10.6 (6.8;18.1), and aPWV 30±11.7(7;13.6) m/s compared to 8.6(7;10.6)m/s, bAA 8%-7.8(3.6;11) in comparison with 7.2(4.5;11.4) respectively. aPWV showed moderate significant correlation with hsCRP-parameter of disease activity (r = 0.46, p = 0.03).

**Conclusions:** Aortic stiffness is significantly increased in TAA patients and is higher in patients with disease inflammatory activity than that in patients with disease remission. In the analysis of the hsCRP and aPWV there is a moderate significant correlation, the study can confirm the view that one of the determinants of increased aortic stiffness is inflammatory activity in arterial wall.
justing for conventional cardiovascular risk factors. In a subset of individuals with T2DM (n = 195, 68.1 ± 8.3yrs, 55F, 69CVD), three deaths (all non-cardiovascular cause) and 13 MACE (all non-fatal) occurred during a median follow-up period of 3.0 yrs. SRC and DRC were significant independent predictors of MACE after adjusting for age and sex [SRC, hazard ratio 1.26 (95%CI 1.08–1.47); DRC, hazard ratio 2.65 (95%CI 1.19–5.89)], and further adjustments for conventional cardiovascular risk factors and previous CVD history did not affect the relationships.

Conclusions: These findings demonstrate that RPA-derived parameters show different associations with prevalent T2DM and CVD. Furthermore, SRC and DRC predict incident CVD in individuals with T2DM. A multicentre study of T2DM is currently underway to confirm these findings.

PP.19.33 INVASIVE AORTIC PRESSURES IN AN ARAB POPULATION- IMPACT OF AGE & GENDER

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Objective: While pulsatile hemodynamics is well-established as independent prognosticator in various ethnic populations, currently there are no data on these important measures in an Arab cohort.

Design and method: We performed retrospective analyses on invasive central aortic and simultaneously measured non-invasive brachial pressures in some 2900 patients referred for coronary angiography to the Cardiac Catheterization Laboratory at King Abdul Aziz Cardiac Center, King Abdul Aziz Medical City, Riyadh, Saudi Arabia between the years 2010 and 2016. We stratified the central systolic, pulse pressure and pulse pressure amplification by brachial blood pressure categories, age and gender. Results were analysed with JMP, version 7.1(SAS for Windows), p < 0.05 considered significant.

The mean age of the population was 59 ± 11 years, 23% female. There was a significant linear relationship between age, central systolic (r = 0.29, p < 0.0001), diastolic (r = 0.30, p < 0.0001) and pulse pressure (r = 0.45, p < 0.0001). The mean pulse pressure amplification was 5 ± 18 mm Hg with significantly lower values in women than men (10 ± 22 vs. 3 ± 15, p < 0.0001). Central pulse pressure and PP amplification increased linearly with age in both genders until the age of 60 years, after which there was a plateauing effect (p < 0.0001). However, the increase in central pulse pressure with age was steeper in women than men (p < 0.001).

Conclusions: This is the first study describing invasive pulsatile haemodynamic patterns in coronary artery disease patients of Arab descent. The results show reduced pulse pressure amplification values compared with Caucasian data, although gender and age relationships are generally similar in our cohort. Our study also shows women to exhibit an accelerated increase in aortic pressures with age compared with men which may explain the worse outcome in females as observed in acute coronary syndrome registries.
POSTER SESSION

POSTERS’ SESSION P820:
ATHEROSCLEROSIS

PP.20.01 REPRODUCIBILITY OF DIFFERENT MEASURES OF ENDOTHELIAL FUNCTION
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Objective: Brachial artery flow-mediated dilation (FMD) to determine endothelial function is an investigator-demanding method. Impaired endothelial function as measured by FMD is known to be associated with cardiovascular risk factors. Local thermal hyperaemia (LTH) of the skin measured with a laser Doppler flow imager is less demanding and may serve as an alternative. We investigated the reproducibility of LTH and its correlation with FMD. In addition, the association of FMD with post-occlusive dermal hyperaemia (PORH), a widely used measure of microvascular function, was assessed.

Design and method: FMD, LTH and PORH were measured in 27 healthy men (8 smokers) on two occasions, one week apart, at the same time of day. FMD, measured with ultra-sound, was expressed as the maximal percentage increase in brachial artery diameter during reactive hyperaemia. LTH peak was defined as the maximal dermal blood flow (DBF) response within the first ten minutes and LTH plateau as the average DBF response during the last five minutes of 35 heating in arbitrary units (a.u.), measured with a laser Doppler flow imager. PORH Peak and AUC were measured at the volar site of the left forearm just under the pressure cuff, using a laser speckle imager.

Results: Coefficients of variation (n = 27) of the LTH peak and plateau response were 18% and 21%, of the PORH peak and area under the curve (AUC) response both 13% and of the FMD response 21%. The LTH peak and plateau response and FMD response were not correlated, whereas the PORH AUC was correlated with FMD (r = 0.46, p < 0.05) and PORH Peak correlated with LTH Plateau (r = 0.58, p < 0.05).

Conclusions: The reproducibility of the LTH plateau response and FMD response were almost equal in this study. In addition, as LTH and FMD did not correlate, these responses appear to provide different information. PORH, however, correlated partly with both LTH and FMD and should be further investigated as a possible alternative for FMD in long-term outcome studies.

PP.20.02 CHANGES IN MICRO-RNA PROFILE AND MICRO-RNA/MESSENGER-RNA REGULATORY NETWORKS IN HUMAN ENDOTHELIAL CELLS EXPOSED TO ESTRADIOL
C. Hermenegildo 1, D. Perez-Cremades 1, X. Vidal-Gomez 1, A. Mompeon 1, A. P. Dantas 2, S. Novella 1. 1Dep. Physiology, Univ. Valencia and INCLIVA Biomedical Research Institute, Valencia, Spain, 2IDIBAPS and Ins. Clinic Torax, Barcelona, Spain

Objective: Estradiol (E2) exerts a key role in the modulation of vascular function, mainly through endothelium-mediated actions. MicroRNAs (miRNA) are small non-coding RNA that modulate post-transcriptional expression by translation repression or target mRNA degradation. The objective of this study was to determine the cardiovascular pathways regulated by E2-sensitive miRNA and to identify miRNA-mRNA networks in cultured human umbilical vein endothelial cells (HUVEC) by transcriptional analysis.

Design and method: HUVEC were exposed to 1 nM E2 for 24 hours and miRNA were isolated by miRNeasy Mini Kit. miRNA expression was performed with GeneChip miRNA 4.0 Array (Affymetrix). Validation of miRNA expression was determined by qRT-PCR. miRNA-mRNA interactions were reconstructed using previous miRNA microarray data using the same conditions (PLoS One. 2009;4:e824), miRNA-mRNA pairings and canonical pathway analysis were performed using Ingenuity Pathway Analysis software.

Results: 120 miRNAs were differentially expressed in E2-treated cells compared to control, 47 were up-regulated and 73 down-regulated. Fold changes of E2-regulated miRNAs range from -1.76 to 2.02. Most significantly changed miRNA (miR-30b-5p, miR-487a-5p, miR-4710, miR-501–3p, miR-378 h and miR-1244) were validated by qRT-PCR. Bioinformatic analysis determined specific miRNA-mRNA interactions: 81 miRNAs with 1599 mRNA targets. 82.9% of those mRNA targets were inversely correlated to their respective miRNA. We further filtered our miRNA-mRNA pairings using experimentally observed or highly predicted target correlations and we obtained 73 miRNA targeting 698 miRNAs: 47 miRNA were up-regulated (with a total of 474 miRNA targets) and 26 were down-regulated (with a total of 224 mRNA targets). Data analysis revealed significantly changed canonical pathways relevant for endothelial function, including ERK/MAPK signalling, integrin signalling and actin cytoskeleton signalling.

Conclusions: This study identifies E2-induced changes in miRNA expression profile of human endothelial cells. Global miRNA-mRNA networks obtained by integrative microarray analysis elucidate the biological processes by which E2 regulates vascular function.

PP.20.03 LINKING ENDOThelial DYSFUNCTION TO THE BIOLOGICAL PROFILE OF INFLAMMATION AND COAGULATION AT HYPERTENSIVE PATIENTS WITH OR WITHOUT DIABETES MELLITUS

Objective: The objective of the study was to estimate how the pro-inflammatory and pro-thrombotic imbalances correlate with endothelial dysfunction at hypertensive patients (pts) with or without diabetes mellitus (DM).

Design and method: 40 hypertensive pts (mean age 58.4 ± 7.3 years, 52.5% males) group 1 and 40 hypertensive pts with DM, matched for age and sex (mean age 56.5 ± 7.6 years, 55% males) group 2. Endothelial function was evaluated using ultrasound assessment of flow mediated vasodilatation of the brachial artery (FMD). FMD smaller than 2% was considered abnormal. Inflammation profile was estimated by serum measurement of C reactive protein (CRP) and fibrinogen (F). Pro-thrombotic profile was determined by serum measurement of von Willebrand factor (vWF), antithrombin III (AT III), plasminogen activator inhibitor (PAI 1) and homocysteine (H).

Results: In group 1, 13 pts (32.5%) had reduced FMD(%): 7.3 ± 1.6. In group 2, 16 pts (40%) had reduced FMD(%): 6.8 ± 1.9. The difference is not significantly statistic between the two groups (p = 0.44). In group 1, reduced FMD was significantly associated with higher level of CRP (2.65 ± 1.17 mg/l vs 7.84 ± 1.68 mg/l, p = 0.02). In group 2, low FMD was found in a significantly higher proportion at pts with higher level of CRP (2.87 ± 1.33 mg/l vs 9.25 ± 2.03 mg/l, p = 0.008) and also with greater proportion of vWF (87.21 ± 31.73% vs 148.15 ± 42.33%, p = 0.001). In the same group, reduced FMD was significantly associated with higher level of PAI 1 (0.42 ± 0.24 μ/ml vs 0.92 ± 0.35 μ/ml, p = 0.03) and higher proportion of H (4.2 ± 1.3 μ/ml vs 17.4 ± 1.2 nmol/l, p = 0.02).

Conclusions: Hypertensive pts with DM have endothelial dysfunction in a greater but not significant proportion than hypertensive pts without DM. Endothelial dysfunction at hypertensive pts seems to reflect a pro-inflammatory status. Moreover, endothelial dysfunction at hypertensive pts with DM appears to express both pro-inflammatory status and pro-thrombotic imbalance.

PP.20.04 CARDIOPROTECTIVE MODULATION OF T-CELL IMMUNITY BY ANTIHYPERTENSIVE SS-BLOCKER NEBIVLOL DURING EXPERIMENTAL ISCHEMIA IN HUMAN MYOCARDIAL TISSUE
S. Gasser, K. Ablasser, R. Gasser. Dept. of Cardiology, Medical University, Graz, Austria

Objective: Recent experimental evidence suggests a crucial role of T-lymphocytes in the pathophysiology of myocardial injury. It has been indicated that a pro-inflammatory imbalance resulting from T-cell activation could be responsible for activating the inflammatory cascade ultimately responsible for cellular injury, left ventricular dysfunction, remodelling and outcome. In the present study nebivolol is compared to another standard ß-blocker, atenolol, commonly used in the treatment of myocardial ischemia.
Design and method: Myocardial tissue probes derive from the right auricle of patients undergoing cardiac surgery. A small part of the right auricle is removed when the heart is put on extra-corporal circulation. This sample is then placed in cooled Tyrode solution and hypoxia is brought about by switching 100% oxygen to 100% nitrogen (hypoxia) in one of the two chambers. By doing so, we are able to compare ischemic and non-ischemic tissue of the same patient. Snap frozen samples are stored at −70°C until RNA isolation. Quality of isolated RNA is analysed by Agilent Bioanalyzer 2100 system. Arrays are scanned with the ABI 700 Chemiluminescence Array Reader and images, data are processed by PANTHER software.

Results: After 30 minutes of myocardial hypoxia we find that gene expression related to T-cell immunity is more than two-fold up-regulated compared to normoxia controls (25 of 185, 10.4 expected; P < 0.00008). In contrast, when 22.47 mmol nebivolol has been added to the solution, gene expression related to T-cell mediated immunity is significantly down-regulated (21 down of 249, 7.3 expected; P < 0.0001). Conversely, 15 of 21 genes down-regulated by nebivolol during experimental hypoxia have been neither up- nor down-regulated in the presence of an equipotent dose of atenolol during experimental hypoxia. Our observations are in accordance with published data indicating that nebivolol reduced the expression of pro-inflammatory genes in endothelial and vascular smooth muscle cells.

Conclusions: Nebivolol, not atenolol inhibits the expression of T-cell immunity related genes during experimental hypoxia. In the light of recent publications on modulating inflammation by pleiotropic effects of cardiovascular drugs, the specific property of T-cell modulation by the antihypertensive drug nebivolol in myocardial ischemia may warrant further attention.

Objective: Peripheral arterial disease in advanced stages has severe disabling complications. Major amputations and high-mortality rates are common in patients with critical limb ischemia (CLI). The main option of CLI treatment is revascularization (endovascular, open surgery or hybrid). Patients with CLI and lacking option for revascularization have worse prognosis. The purpose of this retrospective study was to investigate the impact of including prostaglandins in the treatment of patients with CLI lacking the possibility of revascularization.

Design and method: This retrospective study cohort includes 67 patients (34 male and 33 female), mean age 71 ± 10.7 years treated for CLI not suitable for revascularization. 13 patients had rest pain and 54 ischemic ulcers or frank gangrene. Mean ankle/brachial pressure index was 0.6. Medial arterial calcification was present in 6 patients (8.9 %). Diabetes mellitus type 2 had 37 patients (55.2 %). Prostaglandin E1 (alfaprostil) was applied by intravenous perfusion with doses of 40 mg twice a day for 2 weeks.

Results: 23 patients (34.3 %) underwent amputation - 17 minor and 6 high, and 27 patients (40.3 %) died during the total follow-up period (01/2009 - 07/2014). Mortality rate was higher in patients who have undergone an amputation, in diabetics and in patients without statin medication.

Conclusions: Our results confirm that therapeutic strategies using prostaglandin treatment in patients with CLI lacking option for revascularization do not affect the overall high mortality. Patients with a history of diabetes mellitus, amputation of lower limb and without statin treatment have higher mortality rate. We have confirmed that statin therapy seems to be a protective factor for patients with critical limb ischemia.
congestive heart failure, atrial fibrillation, acute inflammatory disease. The level of glycated haemoglobin (HbA1c), GFR (CKD-EPI) and blood pressure (BP) were assessed. Oral glucose tolerance test was performed in pts without DM. Serum level of YKL-40 was measured using ELISA kits (Quidel, USA). Data are presented by mediana [25;75 percentile].

Results: A total of 83 patients with HT and CAD were enrolled in the study: 60 pts with T2D (group 1, G1) and 23 pts without DM or glucose intolerance (group 2, G2). The duration of T2D in G1 was 5 [2;10] years. The groups didn’t differ by age (63 [58;72] vs 62[55;67] years, p = 0.52) and GFR (87[74;97] vs 93 [81;100] ml/min/1.73 m², p = 0.08). 21/4 pts had normal GFR (GFR-90 ml/min/1.73 m²) and 27/9 pts had mildly reduced GFR (60-89 ml/min/1.73 m²) in G1/2, respectively (p = 0.21). HbA1c was higher in G1 (7.6 [7.0;9.1] vs 5 [5.5;5.9], p = 0.001), but 13 (57%) pts in G2 had HbA1c level more than 5.7% (criteria of prediabetes). YKL-40 level didn’t differ significantly between two groups: 67,1 [46,1; 113,2] vs 68,0 [37,6; 123,4] ng/ml, p = 0.72. YKL-40 was associated with age (r = 0.49, p < 0.001), duration of T2D (r = 0.36, p = 0.006) and lower GFR (r = -0.42; p < 0.001) in G1.

Conclusions: The level of YKL-40 in pts with HT, concomitant CAD and treated DM isn’t differ significantly from pts without DM. The most of pts in G2 had diabetes according to the results of HbA1c definition that could influence on our study results. YKL-40 is associated with lower GFR and may reflect early renal function decline in hypertensive pts with CAD and T2D.

**PP.20.13**

**THE INFLUENCE OF MONO- AND MULTIPLE ANTIHYPERTENSIVE THERAPY ON THE INTENSITY OF SYSTEMIC INFLAMMATION OF PATIENTS WITH HYPERTENSION**

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Objective: to study the influence of mono- and multiple anti-hypertensive therapy on the systemic inflammation indexes, such as the content of C-reactive protein (CRP), interleukine-6 (IL-6), and the tumor necrosis factor (TNF)

Design and method: 1st and 2nd degree hypertensive disease. 1) 29 patients, with the monotherapy by telmisartanum, the dose of 80 mg per diem; 2) 27 patients, with the monotherapy by S-amlodipine, the dose of 5 mg per diem; 3) 43 patients, with the therapy by the fixed combination of valsartanum with amlodipine, the dose of 160/5 mg per diem. The groups were compatible as the age and body mass index.

Results: The content of CRP in blood was positively found to decrease from 3.9 0.1 to 3.3 ± 0.1 mg/l, IL-6 from 3.9 ± 0.3 to 2.6 ± 0.2 pg/l, and TNF from 0.62 ± 0.10 to 0.57 ± 0.10 pg/l (0.001 for all the indexes), which correlated with AP decrease. The telmisartanum therapy and multiple valsartanum and amlodipine one made the CRP level decrease by 15.9% (from 3.6 ± 0.3 to 3.1 ± 0.2 mg/l; P = 0.04) and 12.5% (from 4.0 ± 0.2 to 3.5 ± 0.24 ml/l; P = 0.03), whereas this level only tended to decrease under the influence of S-amlodipine by 11.2% (from 3.7 ± 0.3 to 3.3 ± 0.2 P = 0.07). Yet it is solely S-amlodipine that made the TNF lessen from 0.67 ± 0.07 to 0.59 ± 0.04 pg/l, i.e. by 11.9% IL-6 content in blood was observed in all of the three groups: under the influence of telmisartanum, by 36.4% (from 4.4 ± 0.7 to 2.8 ± 0.4 pg/l; P = 0.02), S-amlodipine by 39% from 4.1 ± 0.5 to 2.5 ± 0.3 pg/l; P = 0.001), and valsartanum in combination with amlodipine by 31.5% (from 3.8 ± 0.6 to 2.6 ± 0.3 pg/l; P = 0.03).

Conclusions: Demonstrate the decrease in the intensity of systemic inflammation under the influence of the angiotensin 2 receptor blockers and calcium channel blockers both under the mono- and multiple therapy as well as the fixed combination thereof. The lessening of the activity of low grade inflammation is paralleled by AP decrease, which is indicative of the significance of hemodynamic vascular unloading.

**PP.20.15**

**RISK FACTORS FOR CARDIOVASCULAR DISEASES IN PATIENTS WITH RHEUMATOID ARTHRITIS**

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Objective: Cardiovascular diseases are considered to be the leading cause of mortality and are usually caused by atherosclerosis. Accelerated atherosclerosis is confirmed in several rheumatic diseases including Rheumatoid arthritis. Impact of traditional risk factors for atherosclerosis is well known. Results of numerous studies point out the importance of inflammation in the development of atherosclerosis and maintaining the stability of atherosclerotic plaque. In patients with rheumatoid arthritis existence of chronic inflammation is an independent risk factor for accelerated atherosclerosis.

Design and method: To determine the frequency of traditional and non-traditional risk factors for development of cardiovascular diseases in patients with rheumatoid arthritis. In 50 patients with rheumatoid arthritis ESR(pan erythrocyte sedimentation rate), C-reactive protein CRP, fibrinogen, cholesterol, triglycerides, blood pressure RR, rheumatoid factor RF, blood glucose level, gender distribution, age, disease activity DAS 28 score were determined.

Results: In the study group the mean age was 63.4 years, the percentage of females was 80%, ESR in the first hour was 60.1 mm, CRP 31.2 mg/l; cholesterol 5.41 mmol/l; triglycerides 2.76 mmol/l; RF 276; fibrinogen 5.12 g/l; Blood sugar 6.8 mmol/l, RR 140/90 mmHg; DAS 28 score of 6.4.

Conclusions: The presence of traditional and non-traditional risk factors for cardiovascular diseases in patients with Rheumatoid arthritis leads to the development of accelerated atherosclerosis and increased incidence of cardiovascular diseases in these patients.
Table 1. Correlation of carotid stiffness parameters with pulmonary function test in the presence of pulmonary hypertension.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>FVC (%)</th>
<th>FEV1 (%)</th>
<th>FEV1/FVC</th>
<th>DLCO</th>
<th>TLC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>-356</td>
<td>-368</td>
<td>140</td>
<td>335</td>
<td>0.004</td>
</tr>
<tr>
<td>Carotid PWV (m/s)</td>
<td>0.605</td>
<td>-209</td>
<td>364</td>
<td>533</td>
<td>-0.260</td>
</tr>
<tr>
<td>Distensibility (10%)</td>
<td>-586</td>
<td>-217</td>
<td>667</td>
<td>483</td>
<td>0.059</td>
</tr>
<tr>
<td>Distension (μm)</td>
<td>699</td>
<td>141</td>
<td>071</td>
<td>721</td>
<td>0.467</td>
</tr>
<tr>
<td>IMT (μm)</td>
<td>-520</td>
<td>-359</td>
<td>053</td>
<td>467</td>
<td>0.047</td>
</tr>
</tbody>
</table>

*P<0.05, **P<0.01

FVC: forced vital capacity; FEV1, forced expiratory volume in one second; DLCO, diffusing capacity for carbon monoxide (mL CO/min/mmHg); TLC, total lung capacity; Carotid PWV, carotid pulse wave velocity; IMT, intima media thickness

Design and method: We evaluated carotid arterial stiffness by carotid pulse wave velocity (PWV), intima-media thickness, carotid distensibility coefficient and carotid distension by echotracking (MyLabOne Esaote, NIH). Distensibility was calibrated with central pressure pulse obtained by carotid tonometry. We assessed pulmonary function by forced vital capacity (FVC), forced expiratory volume in one second (FEV1), diffusing capacity for carbon monoxide (DLCO) and total lung capacity (TLC). Distribution of data was evaluated, and Spearman’s correlation coefficient was used as the measure of association.

Results: We evaluated forty-nine patients with SSc. 93.9% were females, 12% were ex-smokers and 8.2% hypertensive. Pulmonary hypertension was present in 25 patients (51%) and Raynaud’s phenomenon in 36 (73.5%). The mean time of evolution was 3.3±3.5 years. Among the arterial stiffness parameters, carotid PWV correlated with FVC (rho = 0.06, p = 0.04), distension with FVC (rho = 0.699, p = 0.01) and DLCO (rho = -0.721, p = 0.01). As well as IMT with FVC (rho = -0.520, p = 0.01) and DLCO (rho = -0.447, p = 0.02).

Conclusions: Carotid PWV and IMT were negatively associated with only FVC and DLCO in patients with PH and SSC. On the other hand, distension was positively correlated. These parameters reflect the arterial involvement in the interstitial lung disease and pulmonary vascular disease commonly seen in these patients.

PP.20.20 SODIUM CHLORIDE ALTERS DENDRITIC CELL POLARIZATION TOWARDS TH1 CELLS


PP.20.21 ANTI-INFLAMMATORY EFFECTS OF CAPTOPRIL IN PATIENTS WITH HYPERTENSION UNDERWENT CORONARY ARTERY BYPASS SURGERY

W. Aditya, N. Hersunarti, R. Zahara, R. Soerarso, B. B. Siswanto

PP.20.23 INCREASED OXIDATIVE STRESS AND METALLOPROTEINASE ACTIVITY DURING EXPANSIVE VASCULAR REMODELING IN A MURINE MODEL OF VASCULAR CALCIFICATION AND DIABETES MELLITUS

L. Carmona, Y. Almeida, E. Farias-Silva, L. Alves, E. Burdmann, M. Liberman

Design and method: We conducted a prospective observational study on 45 subjects with hypertension who underwent coronary artery bypass surgery. Levels of inflammation examined by high sensitive c-reactive protein. High sensitive c-reactive protein was measured three times (day prior surgery, third and sixth day after surgery).

Results: Total sample population were 45 subjects with hypertension before and after coronary artery bypass surgery, consisting of 18 subjects did not received captopril and 27 subjects received captopril. There were no significant differences in the factors affecting the increased of high sensitive c-reactive protein. Unpaired T-test results showed no differences between high sensitive c-reactive protein at first and second examination (p<0.05). At the third examination, the average value of high sensitive c-reactive protein in the group of subjects who received captopril (26.92 mg/L) is much lower as compared to subjects did not received captopril (35.0 mg/L), p = 0.06.

Conclusions: Administration of captopril in hypertensive patients after coronary artery bypass surgery can lower high sensitive C-reactive protein greater than patients who were did not received captopril.

Abstracts e253
LATE-BREAKERS POSTER’S SESSION LB02:
SESSION 2 - POSTER

LB.02.01 Atherosclerotic Plaque Inflammation Synchronize with Inflammatory Activity of Visceral Fat
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Objective: Visceral adipose tissue is thought to confer increased cardiovascular risk through leukocyte infiltration and increased adipose macrophage activity. Previous positron emission tomography (PET) studies using fluorodeoxyglucose (FDG) demonstrated that increased FDG uptake could reflect the severity of inflammation in atherosclerotic plaque. We hypothesized that active atherosclerotic change in the major arteries would accompany increased inflammation within visceral fat and it could be detected in humans using combined FDG PET/computed tomography (CT).

Design and method: We observed 44 consecutive subjects with cardiovascular disease. For all of them, an one-hour PET/CT (from brain to foot) was performed after injection of FDG (370–555 MBq). FDG uptake in the aorta or its major branches was evaluated visually and semi-quantitatively. Maximal standard uptake values (SUV) of the highest regions of interest were calculated in the subcutaneous fat and visceral fat area, separately.

Results: Significant FDG uptake in the arterial wall was noted in 21 patients (plaque positive; PP group), all of whom have experienced acute cardiovascular events (acute coronary syndrome or ischemic stroke) within a week. The other 23 patients (plaque negative; PN group) had chronic stable angina or asymptomatic carotid stenosis. Visceral fat SUV was significantly higher as compared to subcutaneous fat SUV (0.49 ± 0.15 vs. 0.15 ± 0.05, p < 0.001) in PP group, whereas there was no significant difference in PN group (0.18 ± 0.07 vs. 0.16 ± 0.03, p = 0.622). When we compared two groups, PP group showed higher visceral fat SUV than PN group (p < 0.001). In terms of subcutaneous fat SUV, the results were similar in two groups (p = 0.773).

Conclusions: We demonstrated that atherosclerotic plaque inflammation was associated with increased inflammation within visceral fat. Our results need to be confirmed by comparison with histologic or other imaging findings. Further evaluation to determine whether metabolic activity of visceral adipose tissue is a marker or mediator of vascular inflammation is also needed.

LB.02.02 An Assessment of Hypertension and Risk Factors Among Law Enforcement Personnel in Jodhpur, India
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Objective: Non-communicable diseases (NCDs) are rising globally particularly in developing nations like India. These NCDs share common behavioural risk factors, namely, tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity etc. Law enforcers are exposed to various occupational stressors leading to NCDs like hypertension, diabetes etc. Therefore this study is conducted to estimate the burden of hypertension and risk factors in this group for recommending a health promotion strategy.

Design and method: A cross-sectional study was conducted among law enforcement personnel of Jodhpur city of Rajasthan for 2 months (Aug-Sep 2016). A total of 5 camps were conducted in the project to cover 280 study participants from all 23 stations/posts on pre-defined dates. The standard WHO-STEPwise approach for NCD surveillance was incorporated as data collection strategy. Data collection process included: A structured interview, physical and biochemical measurements coupled with a health promotion session. Multivariate logistic regression analysis was done to test risk association. Requisite permission, consents and institutional ethical clearance (IEC) were obtained.

Results: The participants had mean age of 39.09 years, most 266 (95.0%) being men and more than half 162 (57.8%) were college educated. Risk assessment revealed high burden of: Tobacco 83 (29.6%) & Alcohol 94 (33.6%) intake, inadequate fruit-vegetable intake 243 (86.8%) & high salt intake 29 (10.4%), inadequately physically activity 212 (75.8%) & obesity 116 (44.3%) and past history of disease i.e CVDs 21 (7.5%), Hypertension 82 (46.4%), Hypercholesterolemia 16 (21.62%) and Diabetes 29 (10.59%). The mean BP reading of participants were 115.8 ± 11.5 mmHg (Systolic) and 80.4 ± 4.9 mmHg (Diastolic). Screening tests suggested that 82 (29.28%) and 213 (76.1%) had Hypertension and Pre-Hypertension respectively. On multivariate logistic regression analysis, hypertension was significantly associated with tobacco (OR:3.7p = 0.045) & alcohol (5.2023), obesity/overweight (5.2022), lower education(3.9.0.041) and diabetes(5.9.0.014). Study participants had poor knowledge and health behaviour in respect of Hypertension and risk factors.

Conclusions: Present study suggests a heavy burden of Hypertension and risk factors among the law enforcement, coupled with poor awareness, lifestyle and treatment seeking behaviour. It’s highly pertinent for stakeholders to develop custom health promotion policy for risk reduction and prevention and control of NCDs.

LB.02.08 Effects of Green Tea Supplementation on Inflammation and Blood Pressure in Induced Hypertensive Rat Model
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Objective: Recent studies indicate the important role of chronic inflammation and oxidative stress in the pathogenesis of hypertension. Green tea, due to the high content of catechins, shows high antioxidant activity. The aim of the study was to determine the effect of supplementation with green tea extract on the blood pressure, on the concentration of selected parameters of inflammation and antioxidant status in the model of high-sodium-diet induced hypertension.

Design and method: The study lasted 42 days. The experimental population consisted of 30 rats. The rats were divided into three groups. The rats in the control group were fed a standard diet with 35 g of NaCl per kg of diet, in the second group hypertensive rats were fed a standard diet with NaCl (35 g/kg diet) and with an extract of green tea (2 g/kg diet). The third group consisted of hypertensive rats fed a standard diet with NaCl (35 g/kg diet), and 4 g of green tea extract/kg diet.

Results: Supplementation with green tea had no effect on body mass of rats on a high-sodium diet. At the end of the experiment systolic blood pressures in SH2 and SH4 groups were significantly lower than in the control group SK. The SH4 group was characterized by a significantly lower diastolic blood pressure value and concentration of TNF-alpha in comparison to the SK group. The rats from both SH2 and SH4 groups were characterized by higher total antioxidant status values compared to the control group.

Conclusions: Supplementation of green tea has a beneficial effect on blood pressure, markers of inflammation and antioxidant status in an experimental model of hypertension.

LB.02.12 TLR4 Antagonism Prevents Early Left Ventricular Hypertrophy and Dysfunction Associated with Neonatal Hyperoxia Exposure
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Objective: Preterm birth is associated with proinflammatory/prooxidative status early in life, and increased risk of cardiovascular diseases (CVD) through mechanisms that are incompletely understood. Our lab has shown in rats that transient neonatal exposure to high O2, an established model of prematurity-related prooxidative conditions, leads to early CVD inflammation and remodeling. TLR4 signaling is a critical link between inflammation and the pathogenesis of CVD. It is unknown whether neonatal programmed innate immunity activation, via TLR4 signaling, impacts long term CVD. In a rat model of prematurity (neonatal high O2 exposure), the current study investigated whether neonatal TLR4 antagonism will prevent the development of early CVD dysfunction.

Design and method: Male Sprague-Dawley pups were kept with their mother in 80% O2 or room-air from day (P) 3 to 10 of life. A subgroup was sacrificed at P10 to assess TLR4 protein expression. In other experiments, pups were treated i.p. with TLR4 antagonist LPSRS (100 mg/kg) or vehicle (0.9% NaCl) at P3, P6 and P9 (concomitant to O2 exposure; n = 6–9 per group, max 3 animals/group/iter). At 4 and 7 weeks, body weights were measured and left ventricular (LV) echocardiography was performed under isoflurane anesthesia using VEVO 3100 system (VisualSonics). Comparisons were made using Student’s t-test or ANOVA.

Results: At P10, cardiac TLR4 protein expression was increased ~2 fold in hyperoxia-exposed pups compared to room-air controls (P < 0.05). At 4 weeks, body weight in vehicle- or LPSRS-treated hyperoxia animals (101 ± 2 g and 106 ± 2 g) was lower compared to room-air animals (117 ± 2 g, P < 0.01). Compared to room-air animals, vehicle-treated but not LPSRS-treated hyperoxia animals exhibited increased LV mass index (3.5 ± 0.1 and 3.4 ± 0.1 vs 3.3 ± 0.1 mg/g, P < 0.05 for hyperoxia vehicles vs room-air vehicles), reduced ejection fraction (74 ± 2 and 79 ± 2 vs 82 ± 1 %, P < 0.05) and fractional shortening (43 ± 2 and 48 ± 2 vs 52 ± 2 %, P < 0.01), reduced cardiac output fraction (0.43 ± 0.02 and 0.48 ± 0.02 vs 0.56 ± 0.03 ml/min/g, P < 0.01), and decreased mitral E-to-A wave ratio (1.3 ± 0.1 and 1.7 ± 0.1 mg/g, P < 0.01). Findings were similar at 7 weeks.

Conclusions: TLR4 antagonism prevents early LV hypertrophy and mild systolic and diastolic dysfunction associated to neonatal exposure to hyperoxia.

LB.02.15 EXERCISE TRAINING COULD REDUCE INFLAMMATORY ACTIVITY OF VISCERAL FAT IN OVERWEIGHT WOMEN

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Objective: Visceral adipose tissue (VAT) is thought to confer increased insulin resistance and cardiovascular risk through leukocyte infiltration and increased adipose macrophage activity. Previous positron emission tomography (PET) studies using fluorodeoxyglucose (FDG) demonstrated that increased FDG uptake could reflect the severity of inflammation in the body. We hypothesized that exercise training could reduce VAT inflammatory activity as well as the body adiposity and it could be detected using combined FDG PET/CT imaging (CT).

Design and method: We observed 23 overweight women who participated in civil exercise training program. Anthropometric and lab data and FDG PET/CT were evaluated before and 3 months after an exercise program, consisting of aerobic exercise (45 min/session, 300 Kcal/day) and muscle strength training (20 min/session, 100 Kcal/day) 5 times per week. An one-hour torso PET/CT was performed after injection of FDG (370–555 MBq). The FDG uptake of VAT was measured using volumetric analysis tool of the PET/CT fusion image on a dedicated workstation and the maximum standardized uptake value (max SUV) in the regions of interest (ROI) was calculated.

Results: At baseline, VAT SUV was significantly correlated to body weight (r = 0.764, P < 0.001), waist circumference (r = 0.586, P = 0.003) and body mass index (r = 0.821, P < 0.001). Follow-up VAT SUV levels significantly decreased from 1.11 to 0.46 (p < 0.001) along with a reduction in weight, waist circumference, and BMI.

Conclusions: These findings suggest that exercise training could reduce not only the body adiposity but also VAT inflammation. PET/CT would be useful to evaluate the inflammatory status of VAT and the effects of therapeutic intervention targeting for that.

LB.02.16 TELEMONITORING AND REMOTE COUNSELING IN HYPERTENSIVE PATIENTS: A ROUTE TO COST-EFFECTIVENESS

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Objective: Blood pressure telemonitoring with remote counseling (BPTM) represents a useful tool for effective management of hypertension (HTN). Unfortunately, the evidence provided by recent studies on economic benefits of this approach is incomplete. The aim of this research was to compare the costs and cost-effectiveness of telemedicine-based intervention and standard care in hypertensive patients.

Design and method: The study enrolled 80 patients aged 18–85 (median 53 years old) with uncontrolled HTN. The subjects were randomized to gender, age and baseline BP – matched groups: BPTM group (n = 50) and usual care (n = 50) with clinic visits. Duration of follow-up constituted 3 months. Economic evaluation consisted of total healthcare costs calculation both for BPTM and usual care.
settled in Euro currency. Cost of illness (COI), incremental cost-effectiveness ratio (ICER) assessment along with cost-utility analysis (CUA) with the use of Short Form-36 (SF-36) were performed.

Results: BPTM group had significantly larger decrease of systolic BP compared to standard care (16 ± 6 mmHg; p = 0.04) while the number of antihypertensive drugs in BPTM remained unchanged (+0.3 drugs; p = 0.15). COI was 2.36 times higher in BPTM than in usual care (196.9 € vs 83.5€; p = 0.005). An ICER was 8.45 €/mmHg (95% CI 4.9 € to 12 €) per patient. BPTM improved quality of life (+2.9 for physical component SF-36; p = 0.04) with 0.6 quality adjusted life years (QALYs) gained per patient. The resultant CUA for BPTM was 2698 € per QALY for patients which is also cost-effective-at a willingness-to-pay threshold of 2038 € per QALY gained. Exemplar targeting BP holdover effect to a ten-year period, a cost-benefit analysis showed that BPTM is more cost-saving than usual care approach (+672.5 € per patient).

Conclusions: Blood pressure telemonitoring with remote counseling facilitate achievement of target blood pressure level in a cost-effective and cost-saving way. The management costs will be compensated by potential prevention of future expenses for complications.

Objective: Optical coherence tomography angiography (OCTA) is a novel, non-invasive OCT technique able to identify and characterize retinal vascular patterns. Aim of our cross-sectional study was to evaluate the correlation between retinal microvascular modifications detected with OCTA and arterial hypertension (AH). We also evaluated the role of OCTA as a useful tool for early diagnosis of sub-clinical organ damage in hypertensive patients.

Design and method: We enrolled 70 subjects: 35 hypertensive and 35 normotensive (NT) patients matched for age, sex and BMI. Hypertensive patients were divided into two groups: mild (Blood Pressure-BP < 160/110 mmHg MH) and severe (BP >180/110 mmHg, SH). OCTA was performed applying different analysis protocols for macula and optic disk, using SD-OCTA Avanti Optovue by SSADA algorithm. OCT angiograms were studied with corresponding OCT B scans and retinal maps, to assess accuracy and clinical utility. Morphological data were correlated to office BP (OBP), central systolic blood pressure (c-SBP) and microalbuminuria (MI) to evaluate the predictive value of OCT analysis.

Results: We observed a lower mean foveal choroidal thickness in hypertensive patients vs normotensive patients (NT 319.68 ± 61.72 mm, MH 251.04 ± 63.1 mm, SH 262.65 ± 51.08 mm = 0.003). Deep vascular layer resulted similar in the three groups (NT: 59.2 ± 1%; MH: 59.2 ± 2%; SH: 57.8 ± 2.6%) as well as deep foveal avascular zone area (NT: 0.34 ± 0.09 mm2; MH: 0.36 ± 0.07 mm2; SH: 0.39 ± 0.1 mm2). Our preliminary data didn’t show a significant correlation between morphological retinal parameters and OBP, c-SBP and microalbuminuria (MI) to evaluate the predictive value of OCT analysis.

Conclusions: Our data show how OCTA could highlight some vascular modifications in hypertensive patients, suggesting a potential usefulness of OCTA to assess ocular damage. We need largest studies to establish a predictive role of this technique.

Objective: Aortic arch calcification (AoAC) score evaluated on plain chest X-ray was proven to be associated with increased cardiovascular risk. We aimed to determine whether the difference between carotid-femoral pulse wave velocity (CFFPWV) and carotid-radial pulse wave velocity (CRPWV) could describe the extent of AoAC in dialysis patients.

Design and method: This cross-sectional study included 61 dialysis patients without previous vascular events. They all underwent chest X-ray. Two radiologists blinded to patient medical records graded aortic arch calcification (AoAC) by using a scale from 0 to 3 (grade0 – no visible calcification, grade1 - < 50% calcification in the arch, grade2 - >50% calcification, grade3 – circumferential calcification). These patients had their CFFPWV and CRPWV measured and the difference (dPWV = CFFPWV-CRPWV) was calculated. Biochemical blood tests included creatinine, urea, uric acid, cystatin C, ferritin, protein, albumin, C-reactive protein (CRP), calcium, phosphate, parathormone, total cholesterol, haemoglobin, platelets, white blood cells. Corrected total calcium and calcium phosphate products were calculated. According to AoAC grade patients were divided into 3 groups: group A – AoAC grade0, group B – grade1, group C – grade2, 3.

Results: Patients with AoAC were significantly older, in height, had higher than 25 kg/m² body mass index (BMI), lower peripheral and central diastolic BP, lower end systolic BP, higher CRP levels. Group B had significantly lower phosphate and calcium phosphate product levels. We observed that patients with AoAC had higher CFFPWV, but lower CRPWV values. dPWV was as follows: A -0.05, B 1.72, C 4.23, p = 0.0115. On multivariate logistic regression models group A was significantly associated with dPWV (OR 0.48), albumin level (OR 0.69), diastolic BP (OR 1.13), BMI (OR 0.68) and time on dialysis (OR 0.99); group C – with dPWV (OR 1.73) and phosphate (OR 1.25). In group B the association was only with CRPWV (OR 0.50), BMI (OR 1.17), dPWV had no significant influence.

Conclusions: The discrepancy between CFFPWV and CRPWV measurement confirms different pattern of elastic vessels (Aorta) and muscular conduit arteries (radial arteries) and can describe the extent of aortic arch calcification in dialysis patients.
Objective: Bioactive peptides (BP) have been widely pursued for the management of hypertension showing an angiotensin I converting enzyme (ACE) inhibitory capacity. They have been widely pursued for the management of hypertension and are believed to exert beneficial physiological effects on the endothelium. We aimed to test ACE inhibitory capacity of a protein hydrolysate containing characterized BP from Spanish dry-cured ham and four purified BP (KPVAAP, KAAAATP, KPGRP, AAATP). Secondly, the current study evaluates beneficial changes in protein expression changes and antioxidant activity over the endothelium.

Design and method: ACE inhibitory activity of BP was evaluated using an enzymatic extract of transiently transfected EAHy 926 endothelial cells. Potential mechanisms of action of BP over endothelial function were quantified by RT-PCR after treatment with TNF-α 100 ng/ml or H2O2 300 mM w/o BP.

Results: Significant ACE inhibition was observed at different concentrations of cured ham hydrolysate and purified BP in a dose-response manner. The following IC50 were found for each BP: Cured ham hydrolysate 410.34 ± 55.79 μM, KPVAAP 108.79 ± 45.76 μM, KAAAATP 485.50 ± 43.47 μM, AAATP 1317.32 ± 161.65 μM and KPGRP 1267.54 ± 43.7516 μM. Cured ham hydrolysate at 50 mg/ml promoted antioxidant activity through catalase, superoxide dismutase and eNOS mRNA higher expression in the presence of H2O2 (p < 0.001). Moreover, purified AAATP (300 μM) also prevented the TNF-α increased ICAM-1 in the presence of TNF-α (p < 0.001). Additionally, purified AAATP (300 μM) also prevented the TNF-α increased ICAM-1 mRNA expression (p = 0.008). KPVAAP and AAATP reverted the TNF-α decreased eNOS mRNA expression (p = 0.02 and p = 0.04, respectively).

Conclusions: Those results suggest protective effects of biopeptides against inflammation and oxidant agents as well as antihypertensive activity. Bioactive peptides from Spanish dry-cured ham could then display benefits in the cardiovascular system, with potential clinical relevance.

Objective: To evaluate the prevalence of physical activity and metabolic syndrome in population of industrial workers in Olsztyn, Poland.

Design and method: N = 173 subjects (62 women, 48 ± 9 years old; 111 men, 45 ± 10 years old, p = 0.12) employed in the same industrial workplace. Analyses were performed separately for 2 groups depending on physical activity: ACT+ (subjects that do sports or gymnastics at least 30 minutes 3 times a week) and ACT- (do sport/gymnastics less than 30 minutes 3 times a week) and ACT+ (subjects that do sports or gymnastics at least 30 minutes 3 times a week) and ACT- (do sport/gymnastics less than 30 minutes 3 times a week).

Results: 52.3% of study group meet the ACT+ criteria (M: 54.5%, F:50.9%). MS was diagnosed in 35.4% subjects (M:43.0%, F:21.1%, p = 0.003). The prevalence of MS in ACT+ was significantly higher in men than in women (50.0% vs 15.4%, p = 0.004) and no significant difference was found in ACT+ (34.0% vs 17.2%, p = 0.109). In ACT+ waist circumference, pulse pressure was significantly lower in ACT+ (respectively 95 ± 10 vs 101 ± 11 cm, p = 0.013, 44 ± 11 vs 48 ± 10 mmHg, p = 0.016) and total cholesterol was significantly higher than in ACT- (221 ± 43 vs 203 ± 28 mg/dl, p = 0.03).

Conclusions: The prevalence of metabolic syndrome in population of industrial workers in Olsztyn, Poland is much higher than an average in Poland (35.4% vs 28.6%), mainly in men (43% vs 31%). MS was diagnosed more frequently in men than in women. The most common MS criterion fulfilled by the subjects was DBP. In men ACT+ MS was less frequent than in men ACT-. It was not observed in women.

Objective: To investigate whether consuming cured-pork ham with characterized ACE inhibitory activity biopeptides modifies blood pressure and improves risk factors. It is either uncertain whether pork meat with lower proteolysis would also have enhanced biological activity. Additional studies are needed to confirm the biopeptide presence. Blood pressure was measured with a sphygmomanometer in order to confirm the biopeptide presence. Blood pressure was measured according to the ESH/ESC guidelines. Blood pressure was measured after completion of each treatment (4 assessments). Both meat products were analysed in order to confirm the biopeptide presence. Blood pressure was measured with a sphygmomanometer in order to confirm the biopeptide presence.

Results: The consumption of dry-cured ham did not affect sodium excretion despite a trend. Total, cholesterol, LDL and basal glucose dropped after dry-cured ham intake (p = 0.00019, p = 0.021 and p = 0.014, respectively), while the rest of biochemical markers remained unaltered. Cooked ham did not affect any of biochemical markers. No significant changes were found in average, respectively), while the rest of biochemical markers remained unaltered. Cooked ham did not affect any of biochemical markers. No significant changes were found in average, respectively).

Conclusions: A daily intake of 80 g dry-cured meat did not increase SBP/DBP nor 24 h sodium excretion. Dry-cured ham biopeptides could exert a plethora of activities over the cardiovascular system including lipid and glucose metabolism. Bioactive activities over the cardiovascular system including lipid and glucose metabolism. Bioactive activities over the cardiovascular system including lipid and glucose metabolism. Bioactive activities over the cardiovascular system including lipid and glucose metabolism.
Conclusions: Uric acid levels higher than 4.75 mg/dl were significantly associated with the impaired FMD in our study independent of the other components of metabolic syndrome. Though higher uric acid levels were associated with a lower serum RNI level, it did not reach statistical significance. The mechanism by which uric acid may cause endothelial dysfunction is not known and requires further research.

**LB.02.28**
HIGH PROTEIN INTERMITTENT FASTING INCREASES SERUM POLYCHLORINATED BIPHENYLS AND DECREASES OXIDATIVE STRESS IN OBESE ADULTS

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**Objective:** The purpose of this study is to examine the effect of 12-week high-protein intermittent fasting and 52-week of modified high-protein caloric restriction on serum polychlorinated biphenyls (PCBs) and oxidative stress in 40 obese men and females.

**Design and method:** Forty obese adults (men, n = 21; women, n = 19) were recruited. Study was divided into two separated phases (Phase I and Phase II). Phase I: 12-week high-protein, intermittent fasting, low-calorie weight loss diet. Phase II: 52-week weight maintenance diet comparing high-protein, intermittent fasting with a traditional healthy diet. Serum polychlorinated biphenyls and oxidative stress biomarkers (e.g.,thiobarbituric acid reactive substances, TBARS; total antioxidant capacity, TAC) were measured at weeks 1 (baseline), 12 (end of Phase I), and 64 (end of Phase II).

**Results:** Following 12-week acute weight loss stage (Phase I) TBARS was reduced compared to the baseline (0.24 ± 0.15 vs. 0.18 ± 0.11 mM; p < 0.01), which was accompanied by the increase in TAC (18.9 ± 2.6 vs. 19.9 ± 2.3 nmol/mL; p = 0.02). PCB serum concentrations were significantly increased (86.7 ± 45.6 vs. 115.6 ± 65.9 ng/g lipid; p < 0.01). However, there was no significant difference between women and men. Following 52-week of weight maintenance stage (Phase II), two individual PCBs (PCB 170 and PCB 180) were significantly higher in modified high-protein caloric restriction diet compared to the traditional healthy diet. Additionally, PCB changes were positively correlated with TBARS levels (r > 0.42, p < 0.05) and negatively correlated with body composition changes.

**Conclusions:** In conclusion, a 12-week high-protein intermittent fasting diet effectively induced weight loss, mobilized stored PCBs by increasing circulating IGF-1 and visceral adiposity index were estimated.

**LB.02.29**
FEEDING SCHEDULE REDUCES BLOOD PRESSURE BUT DOES NOT PROTECT AGAINST DIET-INDUCED OBESEITY IN RATS


**Objective:** Evidence in mice indicates that limiting food access to the active phase, termed time-restricted feeding (TRF), can prevent diet-induced obesity without the necessity of reducing food intake (FI). We compared TRF with pharmacological treatment using Melanotan 2 (MTII), an appetite suppressor that decreases FI and necessity of reducing food intake (FI). We compared TRF with pharmacological treatment using Melanotan 2 (MTII), an appetite suppressor that decreases FI and necessity of reducing food intake (FI). We compared TRF with pharmacological treatment using Melanotan 2 (MTII), an appetite suppressor that decreases FI and necessity of reducing food intake (FI).

**Results:** Results: Feeding patterns were profoundly different between MTII AM and MTII PM groups, and cumulative FI was significantly lower in both MTII groups compared with Control. However, despite differences in feeding patterns, there were no differences in FI or BW between AM and PM MTII. With TRF approach, daily FI, cumulative FI, BW, fat mass, and lean mass were unaffected by TRF. In contrast, change from baseline in MAP at week 3 was significantly (p = 0.05) lower for TRF and MTII (am and pm) compared with high-fat control. However, MTII was not different than TRF. No change in heart rate was observed.

Conclusions: In conclusion, the profound differences in feeding patterns between MTII AM and PM did not influence MTII-induced body weight loss. In contrast to mice, TRF does not protect against diet-induced obesity in rats, but does reduces blood pressure, suggesting a role for TRF in lowering obesity-related MAP without the need to reduce FI or BW.

**LB.02.30**
INSULIN RESISTANCE AS A DETERMINANT OF INSULIN-LIKE GROWTH FACTOR-1 CONCENTRATION CHANGES IN OBESE CAUCASIAN WOMEN TREATED WITH ORLISTAT, METFORMIN, OR DIET

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**Objective:** The aim of the study was to compare the influence of weight-reducing interventions, including a calorie-restricted diet (LC), metformin (IM), or orlistat (IO) on serum insulin-like growth factor-1 (IGF-1) concentrations, with special respect to initial insulin resistance (IR) status.

**Design and method:** 114 subjects were enrolled in this randomized open label trial. The participants were assigned to receive a low calorie diet (LC), an isocaloric diet and 500 mg metformin twice daily (IM) or isocaloric diet with 120 mg orlistat three times daily (IO). Before and after the intervention body mass index, lipid profile, alanine aminotransferase, aspartate aminotransferase, insulin, glucose, homeostatic model assessment (HOMA-IR), IGF-1, and visceral adiposity index were estimated.

**Results:** The reductions in BMI, and body fat were significant and comparable in both insulin sensitive (IS) and IR groups. Within three intervention groups, when IS and IR groups were directly compared, a greater decrease in HOMA-IR was seen in the LC, a greater reduction in body weight in the IM, and a greater drop in body weight, body fat, and HOMA-IR in the IO group. Reduction was significantly greater in IR women. Women with IR showed a significant increase in IGF-1 concentration. We found significant positive correlations of deltaGF-1 with: initial HOMA-IR and deltaHOMA-IR, initial triglyceride/high-density- lipoprotein (TG/HDL) ratio and deltaTG/HDL ratio; initial VAI and deltaVAI.

**Conclusions:** Only IR, premenopausal showed a significant rise in circulating IGF-1 serum concentrations despite the method of intervention. The increase in IGF-1 was parallel to the improvement of insulin resistance parameters.

**LB.02.31**
PROSPECTIVE OBSERVATION ON THE ASSOCIATION OF METABOLIC SYNDROME WITH SUBCLINICAL LEFT VENTRICULAR CHANGES OVER A SIX-YEAR PERIOD

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**Objective:** Although a variety of approaches used for the management of the metabolic syndrome (MetS) have been published in the literature, any longitudinal studies have not yet examined the effect of treating MetS on the cardiovascular system. This study was designed to evaluate whether the reversal of the MetS is associated with the improvement of left ventricular (LV) structure and function.

**Design and method:** Data were collected from 508 participants who were diagnosed with the MetS at 4th follow-up study of Ansan cohort and also took part in 7th follow-up, the first one in 2007–2008 and the second one in 2013–2014. LV structure and function were assessed using conventional echocardiography and tissue Doppler imaging (TDI) at baseline and after six years follow-up. Subjects were classified into two groups, according to the presence of MetS at follow-up visit: reversed MetS and persistent MetS groups.

**Results:** LV mass index was increased (all P < 0.001) and subclinical LV systolic function (TDI Sm) was decreased (all P < 0.01) in both groups over a six-year period. There were no significant differences in changes of LVMI and TDI Sm over time between the two groups. However, significant impairment of LV diastolic function (TDI Em) over 15 years was observed in the persistent MetS group (P = 0.001), but not in the reversed MetS group (P = 0.139), compared to the baseline. After adjustment for age, gender, and baseline TDI Em, there was
a significant difference in change of TDI Em over time between the two groups (P < 0.001). The independent predictors of TDI Em reduction over time were age (β = -0.106, P = 0.028), gender (β = -0.099, P = 0.012), anti-hypertensive medication use (β = -0.082, P = 0.031), and changes in systolic blood pressure (β = -0.122, P = 0.001) and body mass index (β = -0.133, P = 0.005).

Conclusions: The reversal of MetS did not accelerate subclinical deterioration of LV diastolic parameter during a six-year follow-up. The progression of LV diastolic dysfunction over time was accompanied by an increase in systolic blood pressure and body mass index.

LB.02.32 ANTIHYPERTENSIVE DRUG TREATMENT FOR FIRST TRIMESTER HYPERTENSION GUIDED BY SERIAL AMBULATORY BLOOD PRESSURE MONITORING

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Objective: We used serial ambulatory blood pressure monitoring (ABPM) to guide antihypertensive drug treatment in pregnant women with hypertension found in early pregnancy.

Design and method: We studied 74 pregnant patients referred for office hypertension found in the first trimester. Previous gestational or both gestational/preeclampsia was reported by 61 women, and previous miscarriage or stillbirth by 13 women. Mean patient age was 33.9 ± 4.7 years, and mean body mass index before pregnancy was 24.2 ± 3.3 kg/m². ABPM was performed at 5,10,15,20,25,30,33,35, and 37 weeks. To calculate overall antihypertensive treatment intensity per patient, we defined standard daily drug doses as labetalol 200 mg, methyldopa 750 mg, metoprolol 50 mg, nifedipine 20 mg, and verapamil 120 mg. Statistical analysis was performed using ANOVA.

Results: All 75 children (73 single pregnancies and 1 twin pregnancy) were born alive (28 vaginal deliveries, 46 cesarean sections). Mean gestational age (current pregnancy) was 38.1 ± 2.1 (range 29–40) weeks, and mean birth weight was 3238 ± 561 (range 955–4200) g. Preeclampsia occurred in 10 women, and eclampsia in 3 women. The mean office blood pressure (BP) at the study entry (both treated and untreated patients) was 134.7/84.0 mmHg. ABPM showed normal BP values throughout the pregnancy in 5 patients who did not receive antihypertensive drugs. BP remained well controlled throughout the pregnancy (24-hour mean 120.7–126.8/74.6–78.1 mmHg). Most patients were treated with labetalol (n = 53 at 33–35 weeks, 100–600 mg/day) and methyldopa (n = 54 at 33 weeks, 500–2000 mg/day), with additional nifedipine (n = 10 at 37 weeks, 20–60 mg/day), verapamil (n = 8, 120–240 mg/day) and metoprolol (n = 1, 25–50 mg/day) as required. Treatment was generally initiated/intensified in response to mean ABPM values >130/80 mmHg and/or maximum BP >160/100 mmHg. To maintain good BP control, the number of treated patients increased from 44 at 5 weeks to 63–65 at 25–35 weeks, and the average number of standard daily drug doses in treated patients increased from 1.65 at 5 weeks to 2.93 at 37 weeks (P < 0.001).

Conclusions: Favorable pregnancy outcomes were obtained with serial ABPM-guided antihypertensive drug treatment for hypertension found during early pregnancy.
Objective: This study aims to compare the differences of aldosterone, renin level and target organ damage in patients with primary aldosteronism complicated with or without OSAHS.

Design and method: This study retrospectively analyzed patients who were diagnosed with PA in the Department of Hypertension, Ruijin Hospital during the period of 2010.1–2015.11. The cut-off value of plasma aldosterone to renin ratio (ARR) greater than 240 [ng / dl] / [ng / ml / h] was used to screen PA candidates, and plasma aldosterone greater than 60 ng / ml after saline infusion test was used as e PA confirmation criteria. According to the polysomnography, OSAHS was diagnosed with symptoms of apnea hypopnea index (AHI) ≥5 times / hour accompanied by nocturnal snoring or wakefulness or daytime sleepiness.

RESULTS

Patients with both PA and OSAHS had higher BMI, DBP, renin level and lower ARR and eGFR than those of patients without OSAHS. The difference of eGFR remained even after matching with age, BMI and duration of hypertension. OSAHS screening is therefore important in patients with PA.

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ORAL PRESENTATIONS IN POSTER AREA BP05: COMPLICATIONS AND COMORBIDITIES

BP.05.01 THE CLINICAL CHARACTERISTICS OF PATIENTS WITH PRIMARY ALDOSTERONISM COMPLICATED WITH OBSTRUCTIVE SLEEP APNEA - HYPOPEA SYNDROME

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Objective: This study aims to compare the differences of aldosterone, renin level and target organ damage in patients with primary aldosteronism complicated with or without OSAHS.

Design and method: This study retrospectively analyzed patients who were diagnosed with PA in the Department of Hypertension, Ruijin Hospital during the period of 2010.1–2015.11. The cut-off value of plasma aldosterone to renin ratio (ARR) greater than 240 [ng / dl] / [ng / ml / h] was used to screen PA candidates, and plasma aldosterone greater than 60 ng / ml after saline infusion test was used as e PA confirmation criteria. According to the polysomnography, OSAHS was diagnosed with symptoms of apnea hypopnea index (AHI) ≥5 times / hour accompanied by nocturnal snoring or wakefulness or daytime sleepiness.

Results: This study included 677 patients with PA, among them, 68 patients complicated with OSAHS. The prevalence of PA complicated OSAHS is 10.04%. Our study shows that PA with OSAHS group had significantly higher diastolic blood pressure (DBP), body mass index (BMI), triglyceride and low density lipoprotein level, left ventricular end-diastolic diameter and carotid intima-media thickness, and lower estimated glomerular filtration rate (eGFR) than those of patients without OSAHS group. In addition, the supine plasma renin activity of patients with PA and OSAHS was significantly higher, but plasma aldosterone level and ARR were not higher in patients using antihypertensive medication. In addition to these results, we will present results of the 18 months follow-up during the ESH meeting.

Conclusions: This study showed that orthostatic decrease is more prominent in untreated HT. In contrast, elevated orthostatic hypotension and OSH was not higher in patients using antihypertensive medication. In addition to these results, we will present results of the 18 months follow-up during the ESH meeting.
Conclusions: The highest rate of HTN control was evident in patients without any sleep disturbances (10.2%), insomnia and short sleep duration (5.5%), all three (5.1%). Both insomnia and short sleep duration were more frequent among women than men (20.7% and 9.3% vs. 4.5% and 0.5% respectively; \( p < 0.001 \)). All sleep disturbances are relatively common in treated patients with hypertension. Coexistence of those disturbances is related with worse blood pressure control and CV profile.

Results: Valid data on all three evaluated sleep disorders was available in 3241 patients (mean age 62.7 +/- 12.7 years; F 57.5%, M 42.5%). 47.1% of patients were free of any sleep disorder. Sleep disorders were presents with following frequency: high risk of OSA (17.6%), insomnia (13.5%), high risk of OSA and insomnia (10.2%), insomnia and short sleep duration (5.5%), all three (5.1%). Both insomnia and insomnia with short sleep duration were more frequent among women than men (20.7% and 9.3% vs. 4.5% and 0.5% respectively; \( p < 0.001 \)). All sleep disturbances were characterized by lower rate of hypertension control as compared with patients without those disturbances. The lowest rate of HTN-control was evident in patients with all three disturbances. Coronary artery disease, cerebrovascular disease and high/very high CV risk were more frequent in patients with sleep disturbances with the highest rate in patients with coexistence of sleep disturbances.

Objective: To evaluate the overlap of sleep disorders - obstructive sleep apnoea (OSA) and insomnia and sleep habits (short sleep duration) and differences in clinical characteristics between patients with different sleep disorders in a large sample of patients with hypertension.

Design and method: In a sub-study of the cross-sectional questionnaire-based observational Pol-Fokus study we included 3477 hypertensive patients attending a routine visit in primary or specialist care. To be included patients had to be >18 years old and had to be treated for at least 12 months with antihypertensive drugs. We defined hypertension control as blood pressure (BP) levels both <140 mmHg/<90 mmHg. High risk of OSA was assessed on the basis of STOP-Bang questionnaire results. Insomnia was evaluated by means of Athens Insomnia Scale (AIS) and the patients with AIS score of 8 or more points were labeled as insomnia. Short sleep duration was defined as usual sleep time < 6 hours. Cardiovascular (CV) risk was defined as nocturnal systolic BP > = 120 mm Hg or diastolic BP > = 70 mm Hg and day-time hypertension as systolic BP > 135 mm Hg and diastolic BP >85 mm Hg.

Results: Using aforementioned criteria, the study sample included 68 normotensive subjects (29%), 51 isolated daytime HT (22%), 45 isolated night-time HT (19%) and 72 day-nighttime HT (30%). 2DE LV longitudinal strain gradually and significantly decreased from normotensive subjects across daytime and nighttime HT patients to day-nighttime HT individuals (-21.8 ± 2.6 vs. -19.4 ± 2.3 vs. -18.8 ± 2.4 vs. -17.8 ± 2.1 %, \( p < 0.001 \), respectively). The same direction of changes was also obtained for 2DE LV circumferential strain (-22.6 ± 3.1 vs. -20.9 ± 2.7 vs. -19.7 ± 2.6 vs. -18.2 ± 2.7 %, \( p < 0.001 \), respectively). 2DE radial strain was significantly lower in nighttime HT and day-nighttime HT patients than in controls (39.4 ± 8.8 vs. 37.7 ± 9.1 vs. 35.1 ± 7.8 vs. 34.0 ± 8.0, \( p = 0.001 \), respectively). LV twist increased from normotensive subjects across daytime and nighttime HT patients to day-nighttime HT individuals (18.0 ± 6.3 vs. 19.7 ± 6.6 vs. 21.4 ± 7.1 vs. 22.2 ± 7.5 \( < \text{degree} \), \( p = 0.005 \), respectively). 24 h systolic BP fall was associated with peak LV longitudinal (\( \beta = -0.477, p < 0.001 \)), LV circumferential strain (\( \beta = -0.405, p < 0.001 \)) and LV twist (\( \beta = 0.389, p < 0.001 \)) in the whole study population independent of LV mass index and E/e' ratio.

Conclusions: Nighttime HT significantly impacts LV mechanics, which gradually deteriorated from normotensive controls, across isolated day- and nighttime HT, to day-nighttime HT. 24-hour systolic BP is associated with LV longitudinal and circumferential strains, as well as LV twist, independently of LV structure and diastolic function.
POSTER SESSION

ORAL PRESENTATIONS IN POSTER AREA BP06:
DIAGNOSIS AND TREATMENT

BP.06.01 THE EFFECTS OF FEBUXOSTAT ON ANGIOTENSIN II-INDUCED VASCULAR REMODELING

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Objective: A xanthine oxidase (XO) inhibitor, febuxostat (FEB) is often used in patients with hyperuricemia. Several reports have suggested that uric acid contributes to endothelial dysfunction and kidney injury. Because XO produces hydrogen peroxide with uric acid in the nucleic acid metabolism, XO inhibitors can also have the anti-oxidative properties. From these reasons, XO inhibitors have the possibilities to suppress cardiovascular diseases. Actually, the effects of FEB on cardiovascular events have been examined in several clinical trials in Japan and several basic researches have suggested that FEB suppressed cardiac fibrosis and renal inflammation, however, those mechanisms remain unclear. In this study, we investigated the effects of FEB on angiotensin II (Ang II)-induced vascular remodeling.

Design and method: To induce vascular remodeling, Ang II (2 mg/kg/day, s.c.) was infused by osmotic mini-pump into the mice. FEB was suspended in 1% carboxymethyl cellulose and administered daily for 14 days. The mice were divided into four groups: control, FEB alone, Ang II alone, and Ang II+FEB. Medial thickening and vascular fibrosis were assessed by Elastica van Gieson stain. Blood pressure was measured by tail-cuff method. The macrophage infiltration and XO localization in the aortic tissue were assessed by immunofluorescence. In our in vitro studies, protein phosphorylation, and Ang II-induced macrophage infiltration were measured by western blotting and MTT assay, respectively.

Results: Serum XO activity was lower in the Ang II+FEB group than in the Ang II alone group. FEB administration suppressed Ang II-induced blood pressure elevation and aortic fibrosis, however it did not affect medial thickening of the aortae. In our in vitro studies, FEB did not change the aortic smooth muscle cell proliferation and ERK1/2 phosphorylation induced by Ang II stimulation. We found that XO was expressed strongly in the macrophages, and Ang II-induced macrophage infiltration in the aortae tended to be suppressed by FEB.

Conclusion: Our results suggested that FEB affects the mechanisms of fibrosis in vascular cells more than those of smooth muscle cell proliferation induced by Ang II. We supposed that FEB suppresses macrophage-derived XO activity in the mouse model of Ang II-induced vascular remodeling.

BP.06.03 COMPARATIVE EFFECTS OF VALSARTAN AND EITHER CILDINPINE OR HYDROCHLOROTHIAZIDE ON MORNING BLOOD PRESSURE SURGE IN MORNING HYPERTENSIVE PATIENTS

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Objective: We previously reported that cilnidipine significantly reduced morning systolic blood pressure (BP) markedly in patients with higher baseline morning systolic BP (SBP) and restored abnormal nocturnal BP dipping status toward a normal dipping pattern. The diuretic was reported to reduce nocturnal BP greater than calcium channel blocker. However, the effects for the reduction of morning surge, which was calculated as morning BP minus nocturnal BP, remains unclear between valsartan/cilnidipine and valsartan/hydrochlorothiazide (HCTZ) combination. The objective of this study was to test the hypothesis that the valsartan/cilnidipine combination suppress morning surge more than the valsartan/HCTZ combination in patients with morning hypertension.

Design and method: This study was a 8-week prospective, multicenter, randomized, open-label clinical trial conducted in Japan. Patients were asked to measure home BP twice each at morning and bedtime during the study period and nocturnal BP over 3 nights prior to the study randomization and the end of treatment. We defined morning surge as mean morning SBP minus mean nocturnal SBP, both measured by home BP monitoring in the same day. Patients who met all of following inclusion criteria were eligible: (1) hypertensive patients with home morning SBP >135 mmHg or diastolic BP >85 mmHg over 3 days, (2) prior medications with valsartan 80 mg. Eligible patients were randomly allocated to either valsartan/cilnidipine (80/10 mg) or valsartan/HCTZ (80/12.5 mg) combination groups.

Results: A total of 129 patients were randomly allocated to valsartan/cilnidipine combination (63 patients; 68.4±13.0 years, 42.9% male) or valsartan/HCTZ combination (66 patients; 67.3±11.7 years, 43.9% male) groups. Baseline morning SBP, nocturnal SBP and morning surge were as follows: 142.4±14.6 vs. 142.4±15.7 mmHg (p=0.981), 124.3±15.6 vs. 125.7±15.2 mmHg (p=0.616) and 17.5±13.4 vs. 16.8±13.9 mmHg (p=0.786), respectively. At the end of treatment period, each parameter was significantly reduced from baseline in both groups. However, there were not a significant difference in morning surge between valsartan/cilnidipine and valsartan/HCTZ combination groups: 14.4±13.0 vs. 14.0±15.2 (p=0.898).

Conclusions: The morning surge was significantly reduced both in valsartan/cilnidipine and valsartan/HCTZ combination groups from baseline. The valsartan/ cilnidipine combination could not significantly suppress morning surge compared to valsartan/HCTZ combination.

BP.06.04 SHAM OR NO SHAM CONTROL: THAT IS THE QUESTION IN TRIALS OF RENAL DENERVATION FOR RESISTANT HYPERTENSION. A SYSTEMATIC META-ANALYSIS

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Objective: Studies of renal denervation (RDN) in patients with apparent treat- ment resistant hypertension have been hampered by a number of patient and phy- sician related confounders on blood pressure (BP) including poor drug adherence. It remains uncertain whether RDN lowers BP. We aimed to investigate whether the use of sham control is essential in RDN studies or whether systematic use of 24-hour ambulatory BP provides enough information thereby making an invasive sham control redundant.

Design and method: We meta-analyzed randomized controlled trials of the BP response to RDN with the SYMPLICITY™ catheter system on top of continued or optimized antihyper- tensive drugs in patients with resistant hypertension. On top of the randomized trials reviewed earlier, we additionally included two studies, one conducted in Spain (24 patients, RDN vs. spironolactone) and one conducted in Denmark (69 patients, sham controlled). We analyzed 24-hour ambulatory BP in 3 sham controlled studies vs. 6 no sham controlled studies.

Results: The updated meta-analysis of 9 studies showed 2.85 mmHg (p = 0.60) and 1.12 mmHg (p = 0.54) reductions in office and in 24-hour systolic BP re- spectively. Meta-analysis of 24-hour systolic BP in the 3 sham-controlled studies showed a reduction of 2.18 mmHg (95% confidence intervals (CIs) -4.70 to 0.33 mmHg, n=396 vs. 229, p=0.09). For the 6 no sham controlled studies there was no difference in 24-hour systolic BP (+0.42 mmHg; 95% CIs -0.20 to 0.76 mmHg, n=162 vs. 174, p=0.90). The test for sub-group heterogeneity showed no significant interaction (p=0.47). Removing one trial at a time produced confirmatory results.

Conclusions: The overall meta-analysis of 9 randomized and controlled studies showed no significant effect on BP of RDN. Our analysis does not support the use of sham control but rather suggests extensive use of 24-hour ambulatory BP in studies of RDN in resistant hypertension.
Objective: Accurate blood pressure measurement is essential for diagnosis and management of arterial hypertension and also for research and epidemiology. The evidence on how the posture influences the blood pressure is not consistent. The aim of this cross-section study was to consider the clinical and epidemiological implications of blood pressure measured in a seated and in a supine position, and to investigate the impact of different clinical parameters of observed differences.

Design and method: This study included 1327 individuals (mean age 58.9 ± 11.7 years) from the Vara-Skövde cohort at the 10 years follow-up visit in 2014. Blood pressure was measured in a seated and in a supine position after a five minutes rest. Mean values from two measurements with one-minute interval were used. Information about participants’ diabetes status, arterial hypertension, leisure time physical activity and smoking habits were obtained. Physical examination included waist circumference, body weight, body height and heart rate. Multivariate analyses accounted for differences in age, sex, BMI, and known diabetes.

Results: In the linear regression model, diastolic blood pressure was significantly higher in the seated position (7.2 mm Hg, p < 0.001), while the corresponding difference of 1.2 mm Hg in systolic blood pressure was not (p = 0.503). The prevalence of high blood pressure in seated position was higher (19.9%) than in supine position (13.5%). Linear regression analysis showed that age (b = -0.217 p < 0.001) and diabetes (b = -0.064 p = 0.035) were associated with smaller differences of postural diastolic blood pressure change and BMI (b = 0.100 p = 0.001) with a higher difference.

Conclusions: This study showed substantial postural differences in office diastolic blood pressure. In fact, diastolic blood pressure was significantly higher in seated position. As a consequence of this, a considerable number of patients in potential need for anti-hypertensive care would not be treated if it would be based on supine measurement of blood pressure. Clinicians should be aware of how age, BMI and diabetes influence these differences. Future research to elucidate the mechanisms behind these differences is warranted.

**BP.06.05** RENAL NERVE STIMULATION IDENTIFIES AORTICORENAL INNERVATION AND PREVENTS INADVERTENT ABLATION OF PARASYmpATHETIC NERVES DURING RENAL SYMPATHETIC DENERVATION

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Objective: Recently we reported the use of renal nerve stimulation (RNS) during renal denervation (RDN) procedures. We hypothesized that electrical stimulation of the sympathetic nerve tissue in the renal artery would lead to an increase in BP and vasmal stimulation would cause a decrease in BP. The objective of the current study is to report the different patterns of BP and heart rate responses elicited by RNS prior to RDN.

Design and method: Thirty-five patients with drug-resistant hypertension were included. RNS was performed under general anesthesia at four sites in the right and left renal arteries, both before and immediately after RDN. RNS-induced BP and heart rate changes were monitored.

Results: A total of 289 RNS sites were in 35 patients were analyzed. An increase in systolic BP of >10 mmHg was regarded as a positive BP response to RNS. This pattern of response was observed in 180 sites (62%). 86 RNS sites (30%) showed an indifferent response with BP changes >10 mmHg. At 13 sites (4.5%) RNS elicited a decrease in BP up to -8 mmHg. However, 10 RNS sites (3.5%) showed a pronounced vasmal response with hypotension and sinus arrests ranging between 4224–10272 milliseconds. These sites were distributed among two patients.

Conclusions: RNS identified sympathetic and parasympathetic nerve tissue in the renal arteries. RNS can be potentially used to map nerve bundles and guide selective ablation of sympathetic nerve fibers and prevent inadvertent ablation of parasympathetic nerve tissue during RDN.

**BP.06.06** EPIDEMIOLOGICAL AND CLINICAL IMPLICATIONS OF BLOOD PRESSURE MEASURED IN SEATED AND SUPINE POSITION

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Objective: Accurate blood pressure measurement is essential for diagnosis and management of arterial hypertension and also for research and epidemiology. The evidence on how the posture influences the blood pressure is not consistent. The aim of this cross-section study was to consider the clinical and epidemiological implications of blood pressure measured in a seated and in a supine position, and to investigate the impact of different clinical parameters of observed differences.

Design and method: This study included 1327 individuals (mean age 58.9 ± 11.7 years) from the Vara-Skövde cohort at the 10 years follow-up visit in 2014. Blood pressure was measured in a seated and in a supine position after a five minutes rest. Mean values from two measurements with one-minute interval were used. Information about participants’ diabetes status, arterial hypertension, leisure time physical activity and smoking habits were obtained. Physical examination included waist circumference, body weight, body height and heart rate. Multivariate analyses accounted for differences in age, sex, BMI, and known diabetes.

Results: In the linear regression model, diastolic blood pressure was significantly higher in the seated position (7.2 mm Hg, p < 0.001), while the corresponding difference of 1.2 mm Hg in systolic blood pressure was not (p = 0.503). The prevalence of high blood pressure in seated position was higher (19.9%) than in supine position (13.5%). Linear regression analysis showed that age (b = -0.217 p < 0.001) and diabetes (b = -0.064 p = 0.035) were associated with smaller differences of postural diastolic blood pressure change and BMI (b = 0.100 p = 0.001) with a higher difference.

Conclusions: This study showed substantial postural differences in office diastolic blood pressure. In fact, diastolic blood pressure was significantly higher in seated position. As a consequence of this, a considerable number of patients in potential need for anti-hypertensive care would not be treated if it would be based on supine measurement of blood pressure. Clinicians should be aware of how age, BMI and diabetes influence these differences. Future research to elucidate the mechanisms behind these differences is warranted.

**BP.06.07** EFFECTS OF RENAL DENERVATION ON CARDIAC OXIDATIVE STRESS AND SYMPATHETIC NERVE REMODELING AFTER MYOCARDIAL INFARCTION IN CANINE

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Objective: To observe the effects of RDN on the cardiac Oxidative Stress and ventricular remodeling due to MI in canine.

Design and method: Anterior myocardial infarction was produced by gelatin sponge embolization of the left anterior descending artery. Eighteen canine were randomly divided into three groups. SHAM group (Sham operation group, renal arteriography performed a week after coronary angiograph, n = 6), MI group (renal arteriography performed a week after MI, n = 6), RDN group (RDN performed a week after arterial embolization of the left anterior descending artery. Eighteen canine were randomly divided into three groups. SHAM group (Sham operation group, renal arteriography performed a week after coronary angiograph, n = 6), MI group (renal arteriography performed a week after MI, n = 6). Four weeks post-MI,echocardiography examination was administered to identify left ventricular end-diastolic dimension (LVEDD), left ventricular end-systolic dimension (LVESD), fraction shortening (FS) and left ventricular ejection fraction (LVEF). Left ventricular systolic pressure (LVPSP), left ventricular end-diastolic pressure (LVEDP) and heart rate (HR) were measured. Myocardial superoxide dismutase (SOD) activity, malondialdehyde (MDA), superoxide anion (O2-) and expression of p47phox mRNA were detected. Immunohistochemical assay was used to analyze the distribution and density of tyrosine hydroxylase (TH) positive staining nerve fibers in kidney. Serum creatinine was detected 4 weeks post-MI to assess renal function.

Results: Compared with SHAM group, LVEF, FS and LVSP were decreased in MI group and RDN (P < 0.05), but LVEDD, LVEDV and LVEDP were increased (P < 0.05). In contract, compared with MI group, LVEF was increased (P = 0.028), while LVEDD and LVEDV were significantly lowered in RDN group (P = 0.05), but no significant differences were observed in FS and LVSP between the two groups (P = 0.092/0.931). There were no significant differences in heart rate among the three groups (P = 0.621). Although SOD lower and the O2-, MDA and p47phox mRNA were higher in MI group and RDN group, compared to the MI group (P < 0.05). Between-group comparisons demonstrated no differences in serum creatinine (P = 0.706).

Conclusions: RDN should have effects to decrease the level of cardiac oxidative stress, attenuate cardiac remodeling, and improve heart function, without affecting renal function in post-MI HF canine model.
OBJECTIVE: To assess the relation of hypertension response to exercise (HRE) with sympathetic overactivity and arterial stiffening in pediatric patients after aortic arch repair.

METHODS: Seventeen patients after aortic arch repair without pressure gradient after repaired site were enrolled. A pressure sensor mounted catheter recorded 24-hour ambulatory BP and heart rate. Ipsilateral carotid to femoral pulse wave velocity (PWV) and muscle sympathetic nerve activity (MSNA) were measured. Arterial stiffness was evaluated on the basis of carotid to femoral pulse wave velocity (PWV) values. In the total population, peak exercise systolic BP was related to 24-h systolic BP (r = 0.229, p < 0.05), PWV (r = 0.218, p = 0.002), and MSNA (r = 0.214, p < 0.05). Moreover, MSNA was related to waist circumference (r = 0.33, p = 0.004) and office systolic BP levels (r = 0.31, p < 0.05) but there was no association with PWV values (p = NS).

CONCLUSIONS: In subjects with high normal BP, a HRE indentifies a state of arterial stiffening and sympathetic overdrive, as reflected by increased PWV and MSNA levels respectively. These finding suggest that exercise testing provides additional clinical information regarding the vascular status and modulation of sympathetic tone in this setting.
ASSOCIATION BETWEEN URIC ACID AND CARDIAC, VASCULAR AND RENAL TARGET ORGAN DAMAGE IN HYPERTENSIVES SUBJECTS

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We enrolled 632 consecutive outpatients, followed by the Hypertension Unit of S. Gerardo Hospital (Monza, Italy) affected by essential HT. We evaluated anamnestic data, clinical Blood Pressure (BP) and laboratory data as covariates.

Results: Mean age was 53.4 ± 12.7 years. Systolic and Diastolic BP (SBP/DBP) were 140.5 ± 18.8 and 85.1 ± 13.1 mmHg and SUA was 5.2 ± 1.4 mg/dL. Regarding TDM mean LVMI was 109.6 ± 31.4 g/m², IMT 0.71 ± 0.01 mm, PWV 8.5 ± 2.2 m/s, while creatinine and microalbuminuria were 0.8 ± 0.2 mg/dL and 25.4 ± 126.1 mg/24 h respectively. When subjects were divided into high and low SUA group (depending on the median SUA of 5.2 mg/dL), with similar age and BP values the first group showed significantly higher values of metabolic index (BMI: 27.9 ± 4.1 vs 25.7 ± 4.1 kg/m²; HDL chol: 49.8 ± 13.1 vs 56.8 ± 14.1 mg/dL; triglycerides: 136.1 ± 81.9 vs 104.2 ± 58.1 mg/dL; glucose: 95.4 ± 27.4 vs 86.4 ± 28.2 mg/dL, p < 0.01 for all), LVMI (117.1 ± 32.8 vs 102.1 ± 28.1 g/m², p < 0.01), IMT (0.73 ± 0.1 vs 0.70 ± 0.01, p = 0.04), PWV (8.8 ± 2.4 vs 8.3 ± 2.1 m/s, p = 0.01) and creatinine (0.9 ± 0.2 vs 0.7 ± 0.1 mg/dL, p < 0.01) and lower E/A (1.0 ± 0.3 vs 1.1 ± 0.3, p = 0.01). SUA showed significant correlation with sex (r = -0.41, p < 0.01), age (r = 0.12, p = 0.01), BMI (r = 0.33, p < 0.01), SBP (r = -0.10, p < 0.01), HDL chol (r = 0.27, p < 0.01), triglycerides (r = 0.34, p < 0.01), creatinine (r = 0.21, p < 0.01), E/A (r = 0.42, p < 0.01), IMT (r = 0.12, p < 0.01), LVMI (r = 0.24, p < 0.01) and E/A (r = -0.15, p < 0.01).

Regarding TDM only creatinine presents SUA as significant determinant in logistic regression analysis with age, sex, BMI, HDL chol, triglycerides and glucose as covariates.

Conclusions: In HT, SUA values correlate with metabolic derangements and with cardiac, vascular and renal TDM. The most significant correlation is with renal damage.

ACUTE ADMINISTRATION (SINGLE DOSE) OF BEETROOT JUICE ATTENUATES BLOOD PRESSURE DURING ISOMETRIC EXERCISE IN UNTREATED HYPERTENSIVE PATIENTS

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Objective: Resistance (dynamic/ isometric) exercise has been proposed for the management of blood pressure (BP) in hypertensive individuals, as an adjunct to aerobic exercise. Clinicians, however, are skeptical in prescribing resistance exercise to hypertensives as these patients may exhibit exaggerated BP responses during this mode of exercise. Dietary nitrate, in form of beetroot-juice (BRJ), has been shown to reduce during aerobic exercise in healthy and to induce BP and vascular benefits at rest in hypertensive individuals. However, the effects of BRJ-supplementation on the BP responses during exercise in hypertensives have not been investigated. This study examined whether a single BRJ-dose may reduce the BP responses of hypertensive during exercise.

Design and method: Untreated, otherwise healthy, hypertensives (42.3 ± 12.3 yrs.) participated in a double-blind, placebo-controlled trial. Each participant consumed, randomly, a nitrate-rich BR (8.1mmol NO3, BRJ) or a nitrate-depleted BR (Placebo) in two visits scheduled one week apart. Before and 2.5 hours after BRJ/placebo consumption, BP responses (Microlife), hemodynamic parameters (systemic vascular resistance and stroke indices) and arterial stiffness were assessed (Impedance Cardiography). Next, participants underwent an exercise protocol, consisting of a 3-min rest, a 3-min handgrip exercise (30% maximal voluntary contraction), and a 3-min recovery. Beat-by-beat BP were continuously assessed via photoplethysmography (Finapress).

Results: At 2.5 hours post-jucme consumption, resting BP (systolic/diastolic) was reduced compared with baseline in BRJ trial (p < 0.01), whereas, it was not significantly altered in placebo. No significant differences were observed in central hemodynamics and arterial stiffness between the pre- and post-jucme consumption values in two trials. Prior to HG-exercise, during 3-min rest, there were no significant differences in BP between BRJ and Placebo. However, during HG-exercise, BP (mmHg) was significantly lower in BRJ vs. placebo (systolic BP: 173.3 ± 11.1 vs 179.2 ± 13.9, p = 0.022; effect size d = 0.47; diastolic BP: 100.7 ± 9.1 vs. 103.4 ± 5.2, p = 0.021; effect size d = 0.38; mean BP: 129.9 ± 8.5 vs. 134.1 ± 6.0, p = 0.012; effect size d = 0.57). During the 3-min post HG-exercise, only the systolic BP was significantly lower in BRJ vs. Placebo (p = 0.054).

Conclusions: A single-dose of BRJ consumption reduces BP during an isometric handgrip exercise protocol in newly diagnosed untreated hypertensive patients.
pooled HRs were 1.8 (0.95, 3.39) for all-cause mortality and 2.53 (1.29, 4.94) for cardiovascular mortality (figure 1). Reported risk estimates of RANK ligand, osteopontin, klotho protein and bone morphogenetic protein-7 were not suitable for pooling, however, only klotho protein was significantly related to mortality. For kidney graft recipients, four studies that investigated the relationship of fibroblast growth factor 23 and osteoprotegerin with mortality were identified, all of which reported a significant association.

**Conclusions:** In hemodialysis patients, fibroblast growth factor 23 is a predictor of all-cause and cardiovascular mortality, whereas the predictive value of osteoprotegerin is restricted to cardiovascular mortality. Further studies are needed in order to gain insight into the prognostic value of these biomarkers in renal transplant recipients.
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Objective: To compare retinal microperfusion and arterial structure between patients with fibromuscular dysplasia (FMD) enrolled to the ARCADIA-POL study and patients with essential hypertension (EHT).

Design and method: From the 144 patients with confirmed FMD in any vascular bed enrolled in the ARCADIA-POL study since January 2015, we assessed data regarding retinal microperfusion and arterial structure available from 119 patients (95F, 24M, mean age: 45.6 ± 14.8 years). All patients underwent detailed clinical evaluation including ABPM, biochemical evaluation and biobanking as well as duplex Doppler of cerebral and abdominal arteries and whole body angiography. We also evaluated 66 age, gender, body mass index, glycemic status, blood pressure (BP) levels and number of medication (p>0.05) matched patients (37F, 29M, mean age: 48.7 ± 10.5 years) with EHT. Retinal microperfusion (RCF) and retinal arteriolar structure were assessed using scanning laser Doppler flowmetry (SLDF). The parameters of retinal morphology: outer diameter (AD), lumen diameter (LD), wall/lumen ratio (WLR), wall thickness (WT), and wall cross-sectional area (WCSA) were determined by automatic full-field perfusion imaging analysis (AFFPIA V.4.011).

Results: When comparing 119 patients with FMD to the matched group of patients with EHT we observed no significant differences in parameters describing retinal morphology. In further analysis we included 41 patients with confirmed FMD in cerebral and/or intracranial arteries and/or intracranial aneurysms (31F, 10M, mean age 45.9 ± 14.3y) and we compared them to 56 matched patients (p>0.05) with EHT (32F, 24M, mean age: 49.8 ± 11.3y). Patients with FMD affecting cerebral and/or intracranial arteries were characterized by lower WLR (0.34 ± 0.08 vs. 0.39 ± 0.09, p = 0.06) and lower WT (13.1 ± 3.4 vs.14.8 ± 3.7 mm, p = 0.02) and lower WCSA (3716.5 ± 1290.5 vs. 4277.4 ± 1387.9 mm², p = 0.05) as compared to patients with EHT. There was no differences in AD, LD, nor RCF between the groups.

Conclusions: In our ongoing ARCADIA-POL study we observed significant changes in retinal arteriolar structure in patients with FMD affecting cerebral and/or intracranial arteries. This may partially reflect altered responsive properties of small artery BP changes in patients with FMD as compared to patients with EHT.

Design and method: Adult male wild-type (WT), SIRT3 knockout (KO) and SIRT3 endothelial cell-specific transgenic (EC-Tg) mice were infused with Angiotensin II (Ang II, 1000ng/kg/min) for 4 weeks. Body weight, blood pressure, renal function, EndoMT, renal capillary density and expression of SIRT3 were assessed. In addition, cultured mouse glomerular endothelial cells (MGECs) were treated with Ang II, and endothelial function and involved SIRT3 signaling pathway were evaluated 72 h later.

Results: Ang II resulted in a significant reduction of SIRT3 expression, induction of EndoMT, and fibrosis in the kidney. SIRT3 KO mice subjected to Ang II infusion exhibited more severe renal dysfunction and increase of EndoMT markers than that of wild type mice. Importantly, SIRT3 EC-Tg mice ameliorated Ang II induced renal fibrosis and EndoMT. In addition, Ang II treatment in cultured MGECs induced EndoMT, decreased Foxo3A acetylation and increased reactive oxygen species (ROS), while these effects were facilitated by SIRT3 overexpression. Upregulation of SIRT3 promoted endothelial function maybe through Foxo3A and ROS signaling pathway.

Conclusions: This study indicates that SIRT3 mediated EndoMT is a novel pathway leading to fibrotic development in hypertensive renal fibrosis, suggesting that improvement of endothelial function by enhancing SIRT3 may be a new strategy to retard the progression of renal injury.

Objective: While the transition of epithelial cells into myofibroblasts has been intensively investigated in renal fibrosis, endothelial to mesenchymal transition (EndoMT) has recently emerged as another potentially important mechanism in promoting fibrosis in chronic kidney disease. However, its underlying molecular mechanisms remain to be elucidated.
Design and method: Adult anaesthetised Sprague-Dawley rats (n = 5) were randomly paced at HRs of 300–500 bpm, at 50-bpm steps. At each step, aortic TT-PWV (two pressure-tip catheters) and BH-PWV (pressure-tip catheter and ultrasonic wall-tracking; abdominal aorta) were measured simultaneously, across a DBP range of 60–110 mmHg as induced by intravenous sodium nitroprusside and phenylephrine infusion (both 30 mg/kg/min). BP wave arrival (TT-PWV) was determined using the maximum of the second-derivative of the BP waveform. After beat detection and segmentation, data from 1368 heart beats was analysed using mixed-effects modelling.

Results: The effect of HR on TT-PWV is negligible at low DBP, but increases proportionally with DBP (Figure A). For BH-PWV the effect of HR is apparently zero at DBP = 85 mmHg, but positive at lower and negative at higher DBP (Figure B, black data). The decrease in BH-PWV with HR observed at DBP = 110 mmHg is explicable by the fact that the standard BH-PWV uses an approximate derivative of pressure to diameter, which overestimates PWV with increasing pulse pressure (PP). PP decreases as HR increases, potentially causing the BH-PWV decrease with HR (Figure C). This effect can be overcome by estimating the pressure-diameter curve for each HR, and calculating the true derivative at DBP (Figure D), yielding a BH-PWV that no longer shows significant HR dependency (Figure B, grey data).

Conclusions: BH-PWV and TT-PWV show different and even opposite HR dependency, depending on DBP.

**BP08.04 COSYNTROPIN INFUSION SIGNIFICANTLY INFLUENCES THE RESULTS OF ADRENAL VENOUS SAMPLING IN PATIENTS WITH PRIMARY ALDOSTERONISM**

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Objective: Adrenal venous sampling (AVS) in primary aldosteronism (PA) enables to identify the patients with unilateral form of the disease who can profit from adrenalectomy. Based on the available evidence, it is not clear whether to perform AVS procedure at rest under physiological conditions or following adrenal stimulation by adrenocorticotropic hormone. Because of this reason, we performed a study to compare the diagnostic value of both AVS protocols.

Design and method: The patients enrolled in the study underwent AVS both at rest and during adrenal stimulation by continuous infusion of cosyntropin. AVS procedure was considered successful provided cortisol concentrations in both adrenal samples were at least three times higher compared to peripheral blood at rest, and at least five times higher during adrenal stimulation. Cortisol corrected aldosterone concentration (AC) in adrenal samples was used to compare the aldosterone secretion between both adrenals. Lateralization index (LI) was calculated as a ratio of AC (dominant adrenal) to AC (non-dominant adrenal). Abnormal lateralization of aldosterone secretion was defined by LI >2 and LI <0.5 (Figure D), yielding a BH-PWV that no longer shows significant HR dependency (Figure B, grey data). 

Conclusions: BH-PWV and TT-PWV show different and even opposite HR dependency, depending on DBP.

**BP08.06 AT2 RECEPTOR-INTERACTING PROTEIN ATTENUATES ISCHEMIC BRAIN DAMAGE IN CONCERT WITH AT2 RECEPTOR ACTIVATION**

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Objective: Accumulating evidences and previous our research suggest that angiotensin II type 2 (AT2) receptor stimulation could contribute to protection against ischemic brain damage. We have cloned ATIP (AT2 receptor interacting protein) as a protein interacting specifically with the C-terminal tail of the AT2 receptor, and suggest that ATIP might play key roles in diverse mechanisms of AT2 receptor signaling. However, the effect ATIP on ischemic brain damage is unclear. Therefore, we investigated the effects of the ATIP and compound 21 (C21), a selective non-peptidic AT2 receptor agonist, on focal cerebral ischemia.

Design and method: Ten-week-old male ATIP-transgenic (ATIP-Tg) and littermate (WT) mice were subjected to middle cerebral artery (MCA) occlusion with silicon-coated micro-filament. C21 (10 mg/kg/day) was administered 2 weeks before MCA occlusion. Twenty-four hours after MCA occlusion, neurological deficit and ischemic area were examined. Cerebral blood flow (CBF) before and after MCA occlusion were measured by laser speckle flowmetry. Expression of mRNA was determined by real-time RT-PCR. Collateral circulation was evaluated by the perfusion of India ink.

Results: Systolic blood pressure did not differ between WT and ATIP-Tg mice. There were no significant differences in neurological deficit and ischemic size without C21 treatment between WT and ATIP-Tg mice. Treatment with C21 improved neurological deficit and decreased ischemic size in both strains, whereas these protective effects of C21 were more marked in ATIP-Tg mice compared with WT mice. Expression of methyl methanesulfonate sensitive 2 (MMS2) mRNA as a neuroprotective factor increased in ipsilateral hemisphere of ATIP-Tg mice compared with contralateral hemisphere. Treatment with C21 did not influence CBF in the core region of ischemic area after MCA occlusion in both strains; however, the reduction of CBF in penumbral region after MCA occlusion was attenuated in ATIP-Tg mice with C21 administration. Moreover, we observed that treatment with C21 tended to increase the cerebral collateral number before MCA occlusion in ATIP-Tg mice.

Conclusions: These results suggested that ATIP could enhance the cerebral protective effects of AT2 receptor stimulation at least in part due to the increase of CBF and MMS2 expression.
RESIDENT STEM CELLS IN THE PERIVASCULAR ADIPOSE TISSUE IS ALTERED DURING AGING

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Objective: The presence of a range of multipotent stem cells in the adventitia of the vessel wall has been identified. However, the resident stem cells in the perivascular adipose tissue (PVAT) is poorly understood in vascular disease. This study aims to characterize the resident PVAT-derived stem cells (PVASCs) and investigate their fate in the vascular remodeling process during aging.

Design and method: PVASCs obtained from the PVAT of mice were characterized by flow cytometry and immunostaining for mesenchymal stem cell (MSC) markers. In vivo, the differential potential of PVASCs was evidenced by matrigel coated PVASC delivery to the perivascular tissue after ligation injury of carotid arteries. PVASCs obtained from patients who underwent coronary artery bypass grafting surgery were also characterized by flow cytometry and immunostaining for mesenchymal stem cell (MSC) markers.

Results: PVASCs showed multiple differentiation capacity towards endothelial cells, smooth muscle cells, osteoblasts and adipocytes. It is worth noting that aged PVASCs showed a depressed differential ability towards multiple potential cells. In vivo, coated aged PVASCs accelerated vascular remodeling compared with young cells, accompanied by reduced differentiation of endothelial cells and perivascular brown adipocytes, and high motility towards myofibroblasts. Moreover, PVASCs obtained from patients who underwent coronary artery bypass grafting surgery also showed expression of typical stem cell markers, CD90 and CD29, as well as higher induction of vascular disease in nude mice after ligation injury.

Conclusions: Taken together, our study is the first report to characterize the resident stem cells in situ from PVAT. The multiple differentiation capacity of PVASCs is altered during aging and participates in the vascular remodeling process.