

POSTER SESSION III

Prevention and health policy: obesity, nutrition and health services

Friday, 7 May 2010, 08:30–12:30 Location: Poster Area

P325

Teaching of cardiovascular prevention and rehabilitation in European medical schools 2009: results of a first institutional surveyP Marques-Vidal¹, H Saner²¹University Hospital Center Vaudois, Lausanne, Switzerland, ²Bern University Hospital, Cardiovascular Prevention and Rehabilitation, Bern, Switzerland**Topic: Health services research****Background:** Little is known regarding the teaching of cardiovascular prevention and rehabilitation (CVP&R) in Europe.**Design:** cross-sectional institutional survey.**Methods:** A questionnaire was sent to 376 European medical schools, 44 National Cardiology Societies, 31 Heart Foundations and 32 National Medical Associations.**Results:** One hundred and twenty medical schools (32% response rate) answered. Forty-three postgraduate courses on CVP&R were provided in 32 (27%) schools. The median number of students was 25 (range: 4 - 140) and the median number of teaching hours was 72 (range: 3 - 518). The topics most frequently taught were cardiovascular risk factors (86%), physical activity (81%), global risk estimation and smoking cessation (both 74%). For the 26 countries for which data was available, 14 (54%) had postgraduate teaching on CVP&R but only three (12%) provided continuous medical education on the topic. Teaching was aimed essentially at cardiologists; in two countries, internists, neurologists and other health professionals (nurses, paramedics) could also attend CVP&R postgraduate courses.**Conclusion:** teaching of CVP&R is low in European medical schools, and the courses provided differ considerably between countries and schools. There is a great need to provide a minimal educational framework to ensure adequate training in CVP&R throughout Europe.

P326

Cardiovascular prevention in Russia: primary care physicians knowledge seems to be an obstacle

N Pogossova, RG Oganov, IY Koltunov, VA Vigodin, OY Sokolova

National Center for Preventive Medicine, Moscow, Russian Federation

Topic: Health services research**Aim:** To assess primary care physicians' beliefs and knowledge concerning secondary prevention in patients with arterial hypertension (AH) and coronary heart disease (CHD) in the Russian Federation.**Materials and methods:** A multicenter study RELIF (REgularnoe Lechenie I proFilaktika) has been performed in 20 big cities of Russia: in each city were randomly selected 5 polyclinics, in each polyclinic 5 general practitioners (GPs). All GPs (N=512) filled out questionnaire containing questions on their demographic data, employment, postgraduate medical education, access to professional information, awareness of National and European guidelines on AH and CHD treatment, knowledge on cardiovascular risk factors (RF) and their goals.**Results:** The average age of participating GPs was 44.2±10.4 years, average work experience 16.7±10.6 years, 89.64% were female, 89% of GPs have completed postgraduate training programs as required by National authorities. 85.4% of GPs reported to be trained in prevention counseling. In previous 5 years they attended 7.2±6.9 scientific congresses and received 9.4±10.3 medical journals, newspapers, print materials on treatment and prevention of cardiovascular diseases. 85% of GPs reported that they have read the National guidelines and 67.8% of GPs guidelines of the European Society of Cardiology on AH and CHD treatment. While answering opened questions on the RF of CHD, 74.68% of physicians named smoking, 70.17% obesity, 53.0% dyslipidemia, 44.42% low physical activity, 40.13% family history of premature CHD, 38.84% stress, 30.26% diabetes, 25.54% - age, 19.31% AH, and only 12.45% - male sex. 70.9% of GPs exactly mentioned the BP cut points for AH I, II and III degrees. 27.8% were aware of target levels for total cholesterol, 11.5% for LDL cholesterol, 51.9% for HDL cholesterol in CHD patients. 72.8% of GPs knew normal ranges of body mass index, but only 40% were familiar with limits of waist circumference. 60.9% of GPs were mistaken while estimating the recommended salt intake for AH patients, at the same time 66.9% knew the proper duration of daily aerobic activity.**Conclusion:** Present study has shown a low level of GPs' knowledge on cardiovascular RF and their secondary prevention goals which can indicate a poor efficacy of current postgraduate training programs and guideline implementation strategies.

P327

HAPIEE study: Dietary patterns and their association with socio-demographic factors in Lithuanian urban population

DI Luksiene, M Baceviciene, A Tamosiunas, R Radisauskas, R Reklaitiene, E Dau-geliene

Institute of Cardiology of Kaunas University of Medicine, Kaunas, Lithuania

Topic: Nutrition

Traditionally nutritional research has focused primarily on single nutrients or food, interest is growing in dietary patterns that consider the complexity of the overall diet.

The aim of the study was to identify the main dietary patterns in Lithuanian urban population and to determine their association with socio-demographic factors.

Material and methods: Data from the survey performed in the framework of the international HAPIEE (Health, Alcohol, and Psychosocial factors in Eastern Europe) study are presented. A random sample of Kaunas men and women aged 45-72 years, stratified by gender and age was randomly selected from Lithuanian population register. 7087 individuals were screened. Response rate was 60.5%. Factor analysis was performed in order to reduce the number of food items. A five-factor solution which accounted 47.8% of the total variance was indicated. The association between dietary patterns and socio-demographic factors was analyzed by logistic regression.**Results:** The first "fresh vegetables, fruit" factor and the second "sweets" factor were inversely associated with age: older people consumed less frequent than average of particular food groups ($p<0.001$). Conversely, third factor "porridge, cereals" was directly associated with age: older people favored this diet ($p<0.001$). The fourth factor "potatoes, meat, boiled vegetables, eggs" was directly associated with age only in women group ($p<0.01$). The fifth factor "chicken, fish" was not associated with age. Men and women with university education were more likely to follow the "fresh vegetables, fruit" and "porridge, cereals" patterns and less likely "potatoes, meat, boiled vegetables, eggs" pattern than people with secondary education: in men - odds ratio (OR)-1.51; OR-1.33 and OR-0.74 respectively ($p<0.01$); in women - OR-1.72; OR-1.42 and OR-0.69 respectively ($p<0.01$). Married men and women were more likely to follow "fresh vegetables, fruit" and "potatoes, meat, boiled vegetables, eggs" patterns than single people ($p<0.001$); also married women favored the "chicken, fish" diet than single women ($p<0.05$). Men and women who self-rated health as poor were less likely to follow the "fresh vegetables, fruit" and "sweets" patterns than people with good health: in men - OR- 0.62 and OR-0.73 respectively ($p<0.05$); in women - OR-0.55 and OR-0.79 respectively ($p<0.05$).**Conclusion:** This study identified five main dietary patterns in Lithuanian urban population. Dietary patterns of people with university education, married and good self-rated health are healthier than among people with lower education, single and poorer health.

P328

Adherence to the Mediterranean dietary pattern is inversely associated with small dense low-density lipoprotein (sdLDL) phenotype B: the ATTICA StudyCM Kastorini¹, DB Panagiotakos¹, C Chrysohou², C Pitsavos², J Skoumas², S Vellaz², M Kambaxis², C Stefanadis²¹Harakopio University, Athens, Greece, ²Hippokraton Hospital, 1st Department of Cardiology of the University of Athens, Athens, Greece**Topic: Nutrition****Objective:** Lipoprotein phenotype B is characterized by a predominance of small dense LDL particles and is associated with increased risk for developing coronary heart disease. The aim of the present work is to examine the relationship between adherence to the Mediterranean dietary pattern and the level of small dense LDL-cholesterol.**Methods:** The ATTICA study is a population-based cohort that has randomly enrolled 1528 men and 1514 women (aged > 18 years old), stratified by age, gender, from the greater area of Athens, during 2001-2002. Adherence to Mediterranean diet was assessed through the Med-DietScore (theoretical range 0-55). The LDL-cholesterol/LDL-apo-B ratio was calculated using the formula $(0.94\text{chol} - 0.94\text{HDL} - 0.19\text{TG}) / (\text{apo B} - 0.09\text{chol} + 0.09\text{HDL} - 0.08\text{TG})$. Lower levels of this ratio indicate the presence of small dense LDL.**Results:** After controlling for several potential confounding factors, participants in the lowest tertile and in the second tertile of the MedDietScore (i.e., <, lower adherence to the Mediterranean diet), had lower LDL-cholesterol/LDL-apo B ratio, compared with those in the highest tertile ($B = -0.063$, $p = 0.012$ and $B = -0.049$, $p = 0.009$, respectively). In addition multiple logistic regression analysis, showed that participants following very closely the Mediterranean dietary pattern have 36% (95%CI: 0.42-0.96) lower likelihood of having levels of the LDL-cholesterol/LDL-apo B ratio below the median, i.e., 1.35, compared with those who follow a more western diet.**Conclusions:** Adherence to the Mediterranean dietary pattern has a protective effect regarding the presence of the more atherogenic small dense LDL particles that are considered a major risk factor for cardiovascular disease.

P329**Effects of nuts on coronary heart disease risk factors in type 2 diabetes**

C Kendall, A Esfahani, S Mitchell, T Parker, M Banach, JA DavidJenkins
University of Toronto, Toronto, Canada

Topic: Nutrition

Background: Diabetes is associated with a significant increase risk in the development of cardiovascular disease (CVD). While recent studies indicate that nut consumption can improve CVD risk factors in hyperlipidemic subjects, few studies have investigated their effect in type 2 diabetes.

Objective: To determine if consumption of nuts improves CVD risk factors and glycemic control in type 2 diabetes.

Methods: 117 subjects with type 2 diabetes were randomized to a 3-month parallel design study. Subjects were randomized to one of three treatments: 1) Test (Full Dose Nut Diet): 75g/d for 2,000kcal/d; 2) Test (Half Dose Nut Diet): half-dose of nuts and half-dose of control muffin; and 3) Control: whole wheat muffins matched with energy content of nut supplements. Fasting blood samples were collected at baseline and weeks 2, 4, 8, 10 and 12 for markers of glycemic control and CVD risk factors.

Results: Compared to the control, the full dose nut supplement significantly lowered HbA1c ($P=0.039$), total-C ($P=0.002$), LDL-C ($P=0.007$), total-C:HDL-C ($P=0.015$), and LDL-C:HDL-C ($P=0.028$). The half-dose of nuts did not result in any significant improvements in blood lipids or glycemic control.

Conclusions: The addition of nuts to the diet improves reduces blood lipid CVD risk factors and glycemic control in type 2 diabetes.

P330**Long-term plant and animal protein consumption are associated with likelihood of developing left ventricular systolic dysfunction, in acute coronary syndrome patients**

CM Kastorini¹, C Chrysoshoou², DB Panagiotakos¹, P Aggelopoulos², C Pitsavos², C Stefanadis²

¹*Harokopio University, Athens, Greece*, ²*Hippokraton Hospital, 1st Department of Cardiology of the University of Athens, Athens, Greece*

Topic: Nutrition

Background and Aims: The aim of the present work was to evaluate the association between plant and animal protein consumption and the development of left ventricular systolic dysfunction (LVSD) in patients who have had an acute coronary syndrome (ACS).

Methods: During 2006-2009, 1000 consecutive ACS patients were included in the study; 459 patients who developed LVSD, 367 males (64 ± 14 years) and 92 females (71 ± 12 years) and 541 patients with preserved systolic function, 421 males (62 ± 12 years) and 120 females (67 ± 12 years). Detailed information regarding their medical records, anthropometric data, physical activity and smoking habits were recorded. Nutritional habits were assessed using a semi-quantitative food-frequency questionnaire and macronutrient consumption was evaluated.

Results: Multi-adjusted analysis after adjustment for various confounding factors revealed that in patients with first coronary event, plant protein intake at the third quartile of consumption was associated with 60% (95%CI:0.17-0.95) lower likelihood of developing LVSD, compared to the first. Furthermore in patients with previous coronary heart disease history, animal protein intake at the highest quartile of consumption, was associated with 211% greater likelihood of developing LVSD (95%CI:1.08-8.98), compared to the first.

Conclusions: Plant protein consumption seems to be beneficial, while animal protein consumption detrimental, against the development of LVSD in post-ACS patients.

P331**Dietary intake of vitamin B6, B12 and folate and their association with homocysteine in adult Polish population**

A Waskiewicz, E Sygnowska, G Broda, W Drygas
National Institute of Cardiology, Warsaw, Poland

Topic: Nutrition**WOBASZ investigators**

Purpose: To assess vitamin B6, B12 and folate intake and describe the relationship of these vitamins with homocysteine (Hcy) level in the Polish population.

Methods: Within the frame of the National Multicenter Health Survey (WOBASZ), a representative sample of whole Polish population aged 20-74 was screened in years 2003-2005. In each province of Poland 6 communities were randomly selected and in each of them a sample of 100 men and 100 women from personal identification number (PESEL) database was randomly selected. In 50% of subjects sample (3004 men and 3401 women) Hcy level and nutrients were performed according to study protocol.

Results: Average intake of vitamin B6 ranged from 2.26 in men to 2.03 mg/day in women, of vitamin B12 from 5.85 to 3.69 µg/day and folate from 258 to 211 µg/day respectively. The recommended levels of intake were not achieved by 16% of men and 36% of women for vitamin B6, by 32% and 51% for vitamin B12 and by 78 % and 90% for folate respectively. Hcy level (after adjustment for age, smoking, coffee and alcohol consumption) and prevalence of hiperHcy ($\text{Hcy} = 12 \text{ } \mu\text{mol/l}$) was falling with an increase of number of quartiles vitamins B6, B12 in both genders and folate in men. In multivariable linear regression model an inverse association between Hcy level and intake of vitamin B6 and folate in both genders and vitamin B12 in men was confirmed.

Conclusions: In Polish population insufficient folate intake was common (deficiency was noted in nearly 80-90% of population) and despite correct average, high share of subjects were not fulfilling B6 and B12 intake recommendations; the inverse association between vitamin B6, B12 and folate consumption and Hcy concentration and prevalence of hiperHcy were observed.

P332**Moderate coffee consumption lowers the likelihood of developing left ventricular systolic dysfunction in post-acute coronary syndrome normotensive patients**

CM Kastorini¹, C Chrysoshoou², D B Demosthenes BPanagiotakos¹, P Aggelopoulos², C Liotou², C Pitsavos², C Stefanadis²

¹*Harokopio University, Athens, Greece*, ²*Hippokraton Hospital, 1st Department of Cardiology of the University of Athens, Athens, Greece*

Topic: Nutrition

Background & Aims: The aim of the present work was to evaluate the association between coffee consumption and the development of left ventricular systolic dysfunction (LVSD) in patients who had had an acute coronary syndrome.

Methods: During 2006/2007, 144 male (65 ± 14 years) and 50 female (71 ± 12 years) post-acute coronary syndrome patients who developed LVSD (ejection fraction $>40\%$) after the cardiac event and 129 male (64 ± 12 years) and 51 female (67 ± 10 years) post-acute coronary syndrome patients without LVSD (ejection fraction $>50\%$) were included in the study. Detailed information regarding their medical records, sociodemographic and anthropometric data, and various psychological and lifestyle characteristics (physical activity, smoking habits, etc.) were recorded. In particular, nutritional habits, including coffee consumption, were evaluated using a semiquantitative food-frequency questionnaire.

Results: Multiaadjusted analysis revealed that in normotensive patients coffee consumption of 12 cups/day was associated with 88% (95% confidence interval, 0.020.84) lower likelihood of developing LVSD and consumption of >3 cups/day with 90% (95% confidence interval, 0.010.88) lower likelihood for LVSD, compared with no history of consumption of coffee and after adjusting for various confounders. In contrast, in hypertensive patients coffee consumption of >3 cups/day was associated with 4.5-fold higher likelihood for developing LVSD (95% confidence interval, 0.8922.58) as compared with no history of coffee consumption.

Conclusions: Coffee consumption has opposite effects on the likelihood of developing LVSD in post-acute coronary syndrome patients depending on their blood pressure levels.

P333

Time to update recommendations on the Mediterranean eating styleS Giampaoli¹, L Palmieri¹, C Donfrancesco¹, C Lo Noce¹, F Dima¹, J Stamler²¹Istituto Superiore di Sanita, Rome, Italy, ²Northwestern University, Feinberg School of Medicine, Chicago, United States of America**Topic: Nutrition**

In 1975 Ancel and Margaret Keys described the Mediterranean eating style in their book, *How to Eat Well and Stay Well The Mediterranean Way*: "the ordinary food of the common Neapolitans – home made minestrone (vegetable soup); pasta in endless variety, always freshly cooked, served with tomato sauce and a sprinkle of cheese, only occasionally enriched with some bits of meat, or served with a local sea food without any cheese; beans and short lengths of macaroni; lots of bread never served with any kind of spread; great quantities of fresh vegetables; a modest portion of meat or fish twice a week; wine; always fresh fruits for dessert." Today this eating style is still the keystone of the Mediterranean way. The Keys book also briefly mentioned potential problems: already in 1975, weight gain – and the issue of energy intake, including from foods high in favorable fats; excess wine intake by men; high salt; increasing intakes of meats, sweets. Since 1975 changes have occurred in Mediterranean countries: industrialization with migration from rural to urban areas; more sedentary work, little physical exercise during leisure; expanded food supply with modifications in diet composition – increased proportions of proteins and fats of animal origin compared to those of vegetable origin; more sugars (e.g. from soft drinks), more salt (from processed foods), less fiber, vitamins, minerals; caloric imbalance from energy-dense foods and reduced caloric expenditure, responsible for epidemic obesity and aggravating risks of major cardiovascular diseases and cancers. There is need to reverse these departures from the Mediterranean eating style, and also to note and overcome its weak points. This is important for a Mediterranean country like Italy, where stroke death rates are twice those of the USA (despite lower CHD rates). Thus, need for dietary sodium intake is 10-20 mmol/day, i.e. 0.5-1.0 gr of NaCl/day. Results of the DASH-Sodium feeding trial are relevant: limited sodium consumption (1.5 gr/day equivalent to 67 mmol/l) along with high intake of fruits and vegetables, whole grains, legumes, low fat and fat free dairy products, fish, poultry; limited in red meat, visible fats, eggs, sweets – effective for reduction of blood pressure and serum lipids in the general population. This is a food pattern like the Mediterranean eating style.

P334

Selenium deficiency is associated with adverse vascular function in patients with high risk for vascular eventsYH Chan¹, CW Siu¹, KH Yiu², HT Chan¹, SW Li³, CP Lau¹, TH Lam¹, HF Tse¹¹The University of Hong Kong, Hong Kong, People's Republic of China, ²Queen Mary Hospital, Department of Medicine, Hong Kong, Hong Kong SAR, People's Republic of China ³Tung Wah Hospital, Hong Kong, People's Republic of China**Topic: Nutrition**

Background: Experimental studies have shown that selenium is involved in the synthesis of selenoproteins relevant to the protection against cardiovascular disease. However, the relationship between selenium deficiency and vascular function in clinical context remains unknown.

Methods: We studied 306 consecutive patients with high risk for vascular events (coronary artery disease 35%, acute/recurrent ischemic stroke 40%, diabetes 58%). Non-invasive brachial-ankle pulse wave velocity (baPWV) was measured using vascular profiling system (VP-2000). Long-term intake of selenium was determined by a validated food frequency questionnaire.

Results: Mean daily selenium intake was 59.4 ± 52.1 mcg/day. Mean baPWV was 1782.4 ± 418.4 m/s indicating increased arterial stiffness overall. Patients with selenium intake <10th percentile had significantly higher baPWV as compared to patients with intake \geq 10th percentile (1994.4 ± 662.6 m/s versus 1761.0 ± 380.8 m/s, $P=0.005$). After adjusting for potential confounders including age, gender, history of hypertension, hyperlipidemia, diabetes and cardiovascular disease, smoking status, use of cardiovascular medications, waist-hip ratio, education/financial status, physical activity, caloric intake and intake of antioxidant vitamins, deficient selenium intake <10th percentile remained independently predictive of increased baPWV by 768.5 m/s [95% CI: 1345.0 - 192.0 m/s, $P=0.010$].

Conclusion: Selenium deficiency is associated with worsening arterial stiffness in patients with high risk for vascular events.

P335

Rural to urban migration in India increases obesity and diabetes riskS B J Ebrahim¹, S Kinra¹, L Bowen¹, L Andersen¹, Y Ben-Shlomo², T Lyngdoh³, D Prabhakaran⁴, K.S Reddy³¹London School of Hygiene and Tropical Medicine, London, United Kingdom, ²University of Bristol, Bristol, United Kingdom, ³Public Health Foundation of India, New Delhi, India, ⁴Centre for Chronic Disease Control, New Delhi, India**Topic: Obesity****Indian Migration Study**

Background: Effects of migration on risk of obesity and diabetes cannot be reliably assessed from simple rural urban comparisons. We hypothesised that rural to urban migrants would be at higher risk of obesity and diabetes than rural non-migrants and that migrants would have an intermediate risk of obesity and diabetes compared with life-long urban and rural dwellers using a sib-pair design.

Methods: The place of origin of people working in factories in north, central and south India was identified. Migrants of rural origin, their rural dwelling sibs, those of urban origin and their urban dwelling sibs were assessed by interview, examination and fasting blood samples. Obesity, diabetes and other cardiovascular risk factors were compared.

Results: A total of 6,510 participants (42% women) were recruited. Among urban, migrant and rural men the age and factory adjusted percentages classified as obese (BMI $25 + \text{kg/m}^2$) were 41.9%, 37.8%, and 19.0% respectively and diabetic were 13.5%, 14.3%, and 6.2% respectively. Findings for women showed similar patterns, but prevalence of obesity was higher and of diabetes was slightly lower than in men. Rural men had lower blood pressure, lipids and fasting blood glucose than urban and migrant men, whereas no differences were seen in women.

Conclusion: Migration is associated with increases in obesity which drive other risk factor changes. Migrants are at higher risk of obesity and diabetes than rural dwellers, but have adopted lifestyles putting them at similar risk to the urban population. Gender differences in some risk factors by place of origin are unexpected and require further exploration.

Migration status: obesity and diabetes

	Men Urban	Women Migrants	Rural	p for trend ^a	Urban	Migrants	Rural	p for trend ^a
Obese	4.32 [3.34,5.59]	3.63 [2.85,4.62]	1	<0.0001	4.98 [3.65,6.79]	4.11 [3.08,5.50]	1	<0.0001
Diabetic	2.74 [1.97,3.81]	2.58 [1.87, 3.56]	1	<0.0001	2.76 [1.64,4.66]	2.70 [1.64,4.45]	1	<0.0001

Odds ratios (95% CI) for the risk of disease in a sibling compared to a rural sibling, adjusted for age group and factory.

P336

12-month weight loss and triglyceride changes with PHEN/TPM in overweight and obese subjects with hypertriglyceridemiaK Gadde¹, C Peterson², B Troupin², WW Day²¹Duke University Medical Center, Durham, United States of America, ²VIVUS, Inc, Mountain View, United States of America**Topic: Obesity****The CONQUER Study Team**

Background: PHEN/TPM is a low-dose, controlled-release combination of phentermine (PHEN) and topiramate (TPM) for once-daily oral dosing. This phase 3 study evaluated weight loss over a 56 week period in overweight and obese subjects with two or more co-morbidities.

Methods: In this double-blind, placebo-controlled trial, 2487 subjects were randomly assigned to one of 2 dose levels of PHEN/TPM (15/92 and 7.5/46 mg) or placebo. All subjects were managed to standard of care for their dyslipidemia, received lifestyle and exercise guidance, and were instructed on a 500 kcal/day deficit diet. Subjects were seen at monthly clinic visits, and had periodic fasting laboratory assessments.

Results: The majority of the 2487 subjects randomized to study treatment were female (70%) and Caucasian (86%). Subjects averaged 51 years of age, with a baseline mean weight of 103.1 kg, mean BMI of 36.6 kg/m², and mean fasting triglycerides of 162.5 mg/dL (1.84 mmol/L). 36% of enrolled subjects were considered hypertriglyceridemic. Mean weight loss at 56 weeks was 1.8%, 8.4%, and 10.4% (ITT-LOCF); and in subjects completing the entire 56 weeks of treatment on study drug, mean weight loss at Week 56 was 2.4%, 10.5%, and 13.2% for the placebo, 7.5/46 mg, and 15/92 mg groups, respectively ($p < 0.0001$). Subjects with hypertriglyceridemia showed comparable weight loss at Week 56. The mean percent change in fasting triglycerides from baseline at Week 56 for the entire study population was a decrease of 11.3 to 13.3% compared to a 1.8% increase in placebo ($p < 0.001$ for PHEN/TPM and 0.005 for placebo). For subjects with hypertriglyceridemia (baseline TG 233 mg/dL, 2.63 mmol/L), the mean percent change in fasting triglycerides at Week 56 with LOCF was -9.4% with placebo, -23.7% with PHEN/TPM 7.5/46 mg, and -25.2% with PHEN/TPM 15/92 mg treatment. Additional lipid parameters will be discussed during the session.

Conclusions: In this large, randomized, controlled clinical trial, significant weight loss and clinically meaningful improvements in lipid parameters were seen over 56 weeks of treatment with both doses of PHEN/TPM compared to placebo. Well-tolerated medical treatments that effect significant weight reduction and can address common obesity-related co-morbidities may have significant benefits in terms of preventing future weight-related morbidity and mortality.

P337**Prevalence of metabolically healthy obesity in a Swiss population-based cohort**S Velho¹, P Marques-Vidal¹, F Paccaud¹, G Waeber², P Vollenweider²¹University Institute of Social and Preventive Medicine Lausanne (IUMSP), Lausanne, Switzerland, ²University Hospital Center Vaudois, Lausanne, Switzerland**Topic: Obesity****Objective:** To assess the prevalence of metabolically healthy obesity (MHO) in the Swiss population according to different definitions.**Methods:** population-based sample of 2803 women and 2557 men. Metabolic abnormalities were defined using two sets of criteria: elevated blood pressure, triglycerides, fasting glucose, high-sensitivity C-reactive protein and homeostasis model assessment (HOMA), and low high density lipoprotein (HDL) cholesterol (set 1); elevated total cholesterol, low density lipoprotein cholesterol and HOMA index, and low HDL cholesterol (set 2). For each set, prevalence of MHO was assessed for three obesity markers (body mass index, waist circumference or body fat).**Results:** Among obese (BMI=30 kg/m²) participants, prevalence of MHO was 18.8% and 7.3% using sets 1 and 2, respectively (3.1% and 1.2% in the general population). Conversely, the prevalences of MHO using sets 1 and 2 were 27.2% and 9.6% when using waist, and 19.6% and 6.4% when using body fat. Prevalence of MHO was higher in women than in men (21.8% vs. 15.8%, for BMI and set 1). After multivariate adjustment, a lower odds of presenting with MHO was found in men: OR=0.59, 95% confidence interval (0.49-0.70); with increasing age: OR=0.59 (0.47-0.73), 0.31 (0.25-0.39) and 0.24 (0.19-0.31) relative to age group 35-44 for age groups 45-54, 55-64 and 65-74 years, respectively; and smoking status: OR=0.83 (0.69-1.00) and 0.80 (0.65-0.98) for former and current smokers, respectively. Conversely, higher odds of MHO were found for moderate alcohol consumption: OR=1.32 (1.07-1.61), 1.35 (1.06-1.71) and 0.98 (0.75-1.26) relative to nondrinkers, for 1-6, 7-13 and >13 drinks/week, respectively; and leisure-time physical activity, OR=1.51 (1.29-1.77). Finally, obese women presented with significantly higher hs-CRP levels and with lower hypertension, hypertriglyceridaemia and hyperglycaemia prevalence than obese men.**Conclusion:** The prevalence of MHO varies considerably according to the definition used. Between-gender differences in the prevalence of the metabolic abnormalities, suggest the need for gender-specific, standardized, agreed upon, MHO criteria.**P338****Effects of an in-patient lifestyle programme for overweight and obese children**M Rank¹, M Siegrist¹, H Langhof², B Wolfarth¹, W Koenig³, M Halle¹¹Technical University of Munich, Munich, Germany, ²Clinic Schoenicht, Berchtesgaden, Germany, ³University of Ulm, Ulm, Germany**Topic: Obesity****Purpose:** Plasma concentration of leptin, an adipokine secreted by adipocytes, is increased in overweight and obese children. It acts as a satiety hormone and links fat mass to food intake and energy expenditure. Furthermore obesity is characterized by a state of low-grade inflammation at all ages. Little is known on the effects of short-term therapy programmes on the relationship between changes in body composition and plasma concentrations of leptin and inflammatory markers in overweight and obese children additionally focusing on changes in exercise capacity.**Methods:** Between 2006 and 2008 we examined 498 overweight and obese children and adolescents (301 girls, 211 boys, age 8-18 years) before and after a 4 week in-patient treatment programme including nutritional counseling, increase in physical activity and behavioral intervention. During the pre- and post-intervention examinations, anthropometric data, plasma concentration of leptin, IL-6 and TNF- α were assessed. The cardiovascular fitness was determined by a cardiopulmonary maximal bicycle-ergometer stress test.**Results:** Over the 4 week intervention we found a significant reduction in body weight from 91.0 \pm 23.1 kg to 84.0 \pm 21.4 kg (p<0.001). Leptin levels decreased significantly from 39.5 \pm 24.5 ng/dl to 18.6 \pm 14.4 ng/dl (p<0.001). In addition, we found an increase in relative exercise capacity from 1.66 \pm 0.40 to 2.04 \pm 0.48 W/kg (p<0.001). Concentrations of IL-6 and TNF- α remained unchanged. Correlation analyses between reduction in body weight and the reduction in leptin concentrations were significant (p < 0.001), whereas the increase of relative exercise capacity was not associated with changes in leptin (p = 0.428).**Conclusion:** A life-style programme significantly improves body weight as well as exercise capacity and induces a reduction in plasma leptin concentration in overweight and obese children. The changes in leptin are dependent on changes in body weight but not on changes in physical exercise capacity. Leptin therefore seems to be independent of exercise capacity.**P339****Trends in overweight and diet among Russian adolescent population**

D Denisova, L Zavyalova, M Voevoda

*Institute of Internal Medicine, Siberian Branch of the Russian Academy of Medical Sciences, Novosibirsk, Russian Federation***Topic: Obesity**

Rising of children and adolescent obesity in recent decades was well documented worldwide, but there is a lack of information about Russian young population.

Objective: Using international references the trends of overweight and nutrition in adolescent population aged 14-17 y during 1989-2009 in Russia were examined.**Design:** Five cross-sectional surveys of representative samples of school children aged 14-17 in 1989, 1994, 1999, 2003 and 2009 were carried out. Total sample was 3060 (45% males). To define overweight the sex- and age-specific body mass index (BMI) cutoffs recommended by the International Obesity Task Force were used. Diet was estimated using 24-hour dietary recall. The questionnaire for parents with the information on self-reported height and weight was used.**Results:** The prevalence of overweight significantly decreased from 12% in boys and from 14% in girls in 1989 to 4% in 1999 for both gender groups. Since 2003 slight increasing of overweight was observed among both genders particularly in boys. During the same period (1989-1999) significant decreasing of total energy intake (from 3021 to 2342 kcal in boys and from 2300 to 1644 kcal in girls) and of basic nutrient intakes (proteins, fats, carbohydrates) was registered. From 2003 to 2009 there was moderate rising of nutrient intakes among adolescents. In spite of concordant trends of overweight and energy consumption there were not associations between BMI and dietary factors in observed population. Associations of parents and children s BMI levels were revealed. Parents of overweight adolescents had BMI higher than parents of adolescents with normal BMI.**Conclusion:** Revealed decreasing of overweight rates among Russian adolescent population during the period of socioeconomic crisis following by changes in diet indicate on significant influences of reforms on life style and some health parameters in children.**P340****Supervised exercise training benefit on physical fitness in young metabolic syndrome patients**C Avram¹, M Oravitan¹, LD Hoble¹, E Bota¹, S Voicu¹, D Gaita²¹West University Timisoara, Timisoara, Romania, ²Victor Babes University of Medicine and Pharmacy, Timisoara, Romania**Topic: Obesity**

Metabolic syndrome (MS) consists of multiple, interrelated risk factors of metabolic origin that appear to directly promote the development of atherosclerotic cardiovascular disease or diabetes mellitus. An important role in MS treatment is played by the lifestyle management including increase in physical fitness.

Purpose: To evaluate the exercise training benefit in young metabolic syndrome patients.**Methods:** We conduct a randomized prospective study of 6 months on 94 voluntary students, previously diagnosed with MS using National Cholesterol Education Program Adult Treatment Panel III criteria. The patients were divided in 2 groups: Group S (43 patients) benefit from an intensive exercise training programme supervised and guided by a personal trainer; Group C: 51 patients had the same exercise training recommendations but were unsupervised. All patients were evaluate through a cardiopulmonary exercise testing (CPET) at inclusion and after 6 months. The CPET results were used to prescribe the optimal effort intensity of the exercise training programme in order to improve endurance and increase the VO₂peak. Exercise recommendation consisted in 3 times per week of 60 minutes at extensive and intensive endurance training zone (in the range of anaerobic threshold), completed by 1 minute interval in the range between anaerobic threshold (AT) and respiratory compensation point (RCP), for every 5 minutes of training.**Results:** The 6 months follow-up of the Group S showed a significant improvement in physical fitness: Oxygen uptake (VO₂) at AT increased from 1.19 to 1.55 L/min, P<0.0001; VO₂ at RCP increased from 1.66 to 1.96 L/min, P=0.0003 and VO₂peak increased from 1.9 to 2.13 L/min, P<0.0001. We also noticed an increase of the oxygen pulse (VO₂/HR an important indices of cardiac performance in exercise) from 10.3 to 11.7 mL, P<0.0001. Even there were no significant differences between groups at baseline, the comparison at the end of the study showed the additional benefit of the Group S patients, which was intensively supervised.**Conclusions:** Six months supervised exercise training programme improves physical fitness in young metabolic syndrome patients. The study is a clear demonstration that using sports technology and close supervision of the exercise programme, we can obtain an additional benefit on physical fitness than recommendations alone. This particular intensive intervention is recommended at least in the beginning of a lifestyle changing programme.

P341

Metabolic syndrome is associated with a higher prevalence of nonalcoholic fatty liver disease

Y Cavusoglu, A Cavusoglu, I Unluoglu, M Unalacak, M Tek, C Demirustu, F Yuksel, N Ata

Eskisehir Osmangazi University, Eskisehir, Turkey

Topic: Obesity

Purpose: The metabolic syndrome (MS) in adults is associated with an increased risk for development of type 2 diabetes and cardiovascular disease. Obesity and elevated fasting triglyceride levels, which are the components of MS, have also been shown to be more tightly correlated with nonalcoholic fatty liver disease (NAFLD). However, the frequency of NAFLD in MS is not clear. Therefore, the aim of this study was to determine whether evidence of NAFLD were more common in patients with MS than in those without MS.

Methods: A total of 251 consecutive subjects were enrolled in the study. A blood sample was obtained for fasting glucose, lipid panel as well as alanine aminotransferase (ALT), aspartate aminotransferase (AST) and gamma-glutamyl transpeptidase (GGT) to determine the presence of markers for NAFLD. Additional liver ultrasound (US) was performed to evaluate the presence of fatty liver. MS was defined by ATP III criteria (3 or more of the following abnormalities): waist circumference >102 cm in men and >88 cm in women; triglycerides (TG) >150 mg/dl; high-density lipoprotein cholesterol (HDL-C) <40 mg/dl in men and <50 mg/dl in women; blood pressure $>130/85$ mmHg; or fasting glucose level >100 mg/dl. Patients with any etiology for abnormal liver function tests such as chronic hepatic or renal disease, alcohol use, hepatotoxic drug use, hepatitis B or C positivity, connective tissue diseases were excluded from the study.

Results: In the study population 67 subjects had 3 or more MS criteria (MS group) and the remaining 184 did not (control group). Mean age was not different between groups with and without MS (46 ± 8 vs 47 ± 9 years, $p = ns$). As has been expected, waist circumference (103 ± 8 vs 95 ± 10 cm, $p < 0.001$), TG (217 ± 86 vs 123 ± 61 mg/dl, $p < 0.001$), fasting glucose (104 ± 36 vs 85 ± 12 mg/dl, $p < 0.001$) were higher and HDL-C (41 ± 10 vs 52 ± 12 mg/dl, $p < 0.001$) was lower in MS group compared with the control group. Mean ALT (31.0 ± 23.0 vs 22.6 ± 15.2 IU/L, $p = 0.001$), AST (23.4 ± 10.3 vs 20.9 ± 7.6 IU/L, $p = 0.038$) and GGT (32.3 ± 23.6 vs 23.7 ± 19.0 IU/L, $p = 0.004$) levels were found to be significantly higher in MS group than in control group. The proportion of subjects with transaminase levels more than the upper limit of normal was also higher in MS group as compared to control group ($\%20.9$ vs $\%8.6$, $p = 0.01$ for ALT, $\%10.4$ vs $\%3.8$, $p = 0.047$ for AST, $\%20.9$ vs $\%5.4$, $p = 0.001$ for GGT). Liver US showed steatosis in 78.5% of subjects with elevated ALT and AST or GGT.

Conclusions: This study suggest that the presence of MS was associated with a significantly higher prevalence of markers for NAFLD and an increase in fatty liver on US.

P342

Physical and psychological aspects of obesity in Lithuanian urban population of Kaunas city

M Baceviciene, D Luksiene, A Tamosiunas, R Reklaitiene, E Daugeliene, R Radisauskas

Institute of Cardiology, Kaunas, Lithuania

Topic: Obesity

Purpose: The aim of the study was to evaluate physical and psychological aspects of obesity in urban Lithuanian population of Kaunas city.

Methods: Random sample of 7115 men and women, aged 45-72, stratified by age and sex was selected from the population register of Kaunas city. Response rate was 60.5%. Health examination as a part of international HAPIEE (Health, Alcohol and Psychosocial factors In Eastern Europe) study was carried out in 2006-2008. Examination included physical measurements and information on risk factors related to lifestyle. 1193 respondents were randomly selected to fill in the WHOQOL-100 questionnaire. The relationship between body mass index (BMI) and life-style related risk factors, objective measurements, overall quality of life (QOL), aspects of energy and fatigue, body image and appearance, mobility, daily activities and dependence on medication were analyzed using age-adjusted general linear models.

Results: 78% of men and 81% of women had excess body weight. Mean systolic and diastolic blood pressure was found to be higher in obese respondents group as compared to the group of fit weight ($p < 0.01$). Obese people had higher levels of fasting blood glucose, triglycerides and low density lipoproteins; whereas high density lipoprotein cholesterol level was lower among obese respondents ($p < 0.001$). Obese women consumed less amounts of alcohol ($p < 0.05$) whereas smoking was more prevalent among obese men ($p < 0.01$) as compared to the groups of normal body mass. Mean amount of hours that were spent for physical activity a week was higher in women with BMI < 25.0 kg/m² as compared to obese women (22.0 and 18.2, $p < 0.05$). Conversely, obese people were tended to follow healthier diet of higher amounts of fresh fruit and vegetables and lower amounts of sweets ($p < 0.05$). When controlling effect of age, mean scores of energy and fatigue, daily activity, dependence on medication, mobility facets and overall QOL were lower in obese respondents as compared to the ones with normal body mass ($p < 0.05$). Obese men and women were less satisfied with their body appearance as compared to the ones with fit body weight (men 67.1 and 69.6, women 58.0 and 68.2 respectively, $p < 0.05$). Obese and overweight women more often rated their health as bad or very bad as compared to women with BMI < 25.0 kg/m² ($p < 0.05$).

In conclusion, high prevalence of obesity in Lithuanian urban population should receive more attention of health policy as a factor predicting poor subjective status and related to large number of conditions linked to reduced objective physical statement.

P343

Effects of physical training on cardiac modulation in normal weight, overweight, and obese individuals: a comparative study

H C Hugo Celso Dutra De Souza, THR Di Sacco, IC Cozza, KD Maida

University of Sao Paulo, Ribeirao Preto, Brazil

Topic: Obesity

Purpose: Our study has assessed the effect of aerobic physical training on the heart rate variability (HRV) on sedentary women with different body mass indices (BMI; weight/height).

Methods: Forty-eight volunteers were divided into three groups according to their BMI as follows: NW group (normal weight), 18.0-24.9; OW group (overweight), 25.0-29.9; and OB group (obese), 30.0-39.9. All the subjects were submitted to aerobic physical training protocol during 12 weeks. HRV was assessed with the subjects at rest and during tilt test by means of spectral analysis.

Results: Prior to aerobic physical training, OW and OB groups exhibited decrease in low frequencies (LF, 0.40-15 Hz) and high frequencies (HF, 0.15-0.5 Hz). After APT, NW, OW, and OB groups had similar HF oscillations, with only OB group exhibiting increase in LF oscillations. The HRV responses to tilt test obtained before and after aerobic physical training showed that NW group had no differences in LF ($34 \pm 6\%$ vs. $36 \pm 8\%$) and HF ($-65 \pm 6\%$ vs. $-60 \pm 7\%$) oscillations. However, OW group had an increase in LF ($46 \pm 6\%$ vs. $86 \pm 14\%$) and HF ($-44 \pm 7\%$ vs. $-61 \pm 7\%$) oscillations, whereas OB group had a decrease in LF ($288 \pm 25\%$ vs. $159 \pm 16\%$) and HF ($-83 \pm 5\%$ vs. $-70 \pm 4\%$) oscillations.

Conclusion: Our results suggest that regular physical activity has a beneficial effect on the autonomic nervous system, thus being a relevant predictor of cardiovascular morbidity and mortality, and that physical training can attenuate the negative effect of obesity.

P344

Nutrient intake in relation to central and overall obesity status among elderly people living in mediterranean islands: the MEDIS study

S Tyrovolas¹, T Psaltopoulou², G Pounis¹, N Papairakleous¹, V Bountziouka¹, A Zeimbekis³, E Gotsis¹, M Antonopoulou¹, G Metallinos¹, E Polychronopoulos¹, C Lionis¹, DB Panagiotakos¹

¹Harokopio University, Athens, Greece, ²Department of Hygiene, Epidemiology, and Medical Statistics, School of Medicine, University of Athens, Athens, Greece, ³Health Center of Kalloni, General Hospital of Mithilini, Mithilini, Greece, ⁴University of Crete, Medical School, Clinic of Social and Family Medicine, Heraklion, Greece

Topic: Obesity

Background: Obesity becomes a global epidemic throughout the developed world. The aim of the present work was to evaluate the relationship between energy-generating nutrients and the presence of central and overall obesity after correcting for socio-demographic, lifestyle and clinical characteristics, among healthy elders.

Methods: During 2005-2007, 553 elderly men and 637 elderly women (mean age 74 ± 7 years) from eight Mediterranean Islands in Greece and Cyprus, were enrolled. The retrieved information included demographic, bio-clinical and dietary characteristics. MedDietScore assessed adherence to the Mediterranean dietary pattern.

Results: The prevalence of obesity was 27% in males and 39% in females ($p < 0.001$), while 73% of males and 87% of females had central obesity. The obese elderly presented higher consumption of carbohydrates ($p < 0.001$) and lower consumption of fat ($p = 0.006$). After adjusting for various confounders, one percent increase in carbohydrate consumption was associated with 12% (95%CI 0.78-0.99) lower likelihood of having central obesity, while one percent increase in carbohydrate and protein consumption was associated with 14% (95%CI 0.78-0.95) and 16% (95%CI 0.72-0.97) lower likelihood of being obese, respectively. Vegetable protein was found to be associated with 15% (95%CI 0.77-0.93) lower likelihood of being obese while, only low glycemic index carbohydrates seem to be associated with a 6% (95%CI 0.90-0.98) lower likelihood of having central obesity.

Conclusions: The presented findings suggest that a diet high in carbohydrates and vegetable protein is associated with lower likelihood of being obese and may help the elderly persons to preserve normal weight.

P345

The healthy knowledge of obese persons, do they know more about cardiovascular diseases prevention? Results of WOBASZ Study

A Piwonska, E Sygnowska, W Drygas

Institute of Cardiology, Warsaw, Poland

Topic: Obesity

WOBASZ group

Purpose: Obesity is one of main risk factors (RF) of CVD morbidity and mortality, because many proven CVD risk factors, like f. e. hypertension, lipid disturbances, diabetes, are strongly associated with obesity. It is also a huge healthy problem in many populations. To have an effective prevention programs one should know the healthy knowledge of population. We want to evaluate the healthy knowledge [on own RF, complications of untreated hypertension (cHT) and prevention methods (PM)] of obese persons and we want to know if it is greater than the knowledge of the rest of population.

Methods: Data came from representative Polish population sample - 6392 men and 7153 women, aged 20-74, examined in 2003-2005 in the frame of Polish National Health Survey (WOBASZ). Data on socio-demographic factors, healthy knowledge were assessed using questionnaire and collected together with data from biochemistry and physical examination. We analyzed the frequency of persons that know their body mass (BM), can correctly classified it to the group of overweight or obesity, know their blood pressure (BP), cHT and MP.

Results: 1313 men - M (21%) and 1612 women - W (22%) were obese. Obese persons were older and independently of age had higher levels of RF. Out of obese persons, 8% of men and 18% of women did not know their own BM, and 30% of men and 25% of women did know their own BP. About 50% both obese, as well as not obese men, could give their BM exactly to the 2 kg, but obese women rarely than the others knew their BM. Obese persons more often than not obese correctly classified their BM. Persons with obesity had significantly better knowledge on own BP and on classification of BP to normal/low or high group. Moreover obese persons (especially men) better knew cHT. About 30% of obese men and women (less than in population with normal weight) did not know any cHT. The knowledge on PM was worse among obese persons or did not differ significantly In comparison to the rest of population. More than 30% of obese persons did not know any PM.

Conclusions: Obese persons were characterized by better, than the rest of population, knowledge on own risk factors or complications of untreated hypertension, but worse knowledge on prevention methods.

POSTER SESSION III Epidemiology and public health

Friday, 7 May 2010, 08:30–12:30 Location: Poster Area

P346

Adherence with statins in a real-life setting is better when cardiovascular risk factors increase

T Couffinhal¹, P Latry², M Molimar³, B Begaud³, M Lafitte¹, K Martin-Latry³

¹University Hospital of Bordeaux - Hospital Haut Leveque, Departement of Cardiology, Pessac, France, ²Direction Regionale du Service Medical de l'Assurance Maladie d'Aquitaine, GNA-M-TS, Bordeaux, France, ³Inserm U 657, Université Victor Segalen Bordeaux 2, Bordeaux, France

Topic: Pharmacoepidemiology

Background: Several studies have shown poor adherence to statin treatments and several associated factors have been highlighted: younger age, insufficient revenue, absence of cardiovascular morbidity, women, number of coprescribed drugs. While the factors for poor adherence have been highlighted, the impact of their combination on adherence is not clear.

Purpose: To estimate adherence for statins and whether it differs according to the number of cardiovascular risk factors.

Methods: A cohort study was conducted using data from the French social security insurance database. Patients were included if they submitted a reimbursement form for a prescription for statins between September 1 and December 31, 2004, and did not receive any statin treatment for 6 months previous to this. Patients were followed up 15 months. Statin use was considered a proxy for hypercholesterolemia. The cohort was split into three groups according to their number of additional cardiovascular risk factors that included age and gender, diabetes mellitus and cardiovascular disease (using co-medications as a proxy). Adherence was assessed for each group by using four parameters: (i) proportion of days covered by statins, (ii) regularity of the treatment over time, (iii) persistence, and (iv) the patient's understanding of the treatment.

Results: 16,397 newly treated patients were identified. Of these statin users, 21.7% did not have additional cardiovascular risk factors. Thirty-one percent had two cardiovascular risk factor and 47% had at least three risk factors. All the parameters showed a sub-optimal adherence whatever the group: days covered ranged from 56% to 72%, regularity ranged from 23% to 33% and persistence ranged from 44% to 59%, but adherence was better for those with a higher number of cardiovascular risk factors.

Conclusions: The results confirm that long-term drug treatments are a difficult challenge, particularly in patients at lower risk.

P347

Atorvastatin worsens glucose metabolism and insulin sensitivity in hypercholesterolemic patients

K Koh¹, Michae Quon²

¹Gachon University, Incheon, Republic of Korea ²NIH, Diabetes Unit, Bethesda, United States of America

Topic: Lipids and atherosclerosis

Background: We hypothesized atorvastatin, particularly at high dose, may increase insulin levels and worsen glucose metabolism with reducing plasma levels of adiponectin and insulin sensitivity in hypercholesterolemic patients.

Methods: This was a randomized, single-blind, placebo-controlled, parallel study. Age, sex, and body mass index were matched. Forty-four patients were given on placebo and 42, 44, 43, and 40 patients were given daily on atorvastatin 10, 20, 40, and 80 mg, respectively during a 2 month treatment period.

Results: Atorvastatin 10, 20, 40, and 80 mg significantly reduced LDL cholesterol (mean % changes; 39, 47, 52, and 56%) and apolipoprotein B levels (33, 37, 42, and 46%) after 2 months therapy when compared with baseline (all $P < 0.001$ by paired t-test) or when compared with placebo ($P < 0.001$ by ANOVA). Atorvastatin 10, 20, 40, and 80 mg significantly increased insulin (25, 42, 31, and 45%) and glycated hemoglobin levels (2, 5, 5, and 5%) from baseline (all $P < 0.05$ by paired t-test) or when compared with placebo ($P = 0.009$ for insulin and $P = 0.008$ for glycated hemoglobin by ANOVA). Atorvastatin 10, 20, 40, and 80 mg decreased plasma adiponectin levels (4, 10, 3, and 9%) and decreased insulin sensitivity (1, 3, 3, and 4%) when compared with baseline ($P = 0.124$, $P = 0.004$, $P = 0.084$, and $P = 0.040$ for adiponectin; $P = 0.312$, $P = 0.008$, $P < 0.001$, and $P = 0.008$ for insulin sensitivity by paired t-test) or when compared with placebo ($P = 0.183$ for adiponectin and $P = 0.033$ for insulin sensitivity by ANOVA). However, the magnitude of these percent changes (glycated hemoglobin, insulin, adiponectin, and QUICKI) were not significantly different among the four different doses of atorvastatin despite dose-dependent changes in LDL cholesterol and apolipoprotein B reduction.

Conclusions: Atorvastatin significantly increased insulin and glycated hemoglobin levels and reduced insulin sensitivity in hypercholesterolemic patients independent of dosage and the extent of LDL cholesterol and apolipoprotein B reduction.

P348

Postprandial lipemia in familial combined hyperlipidemia, familial hypercholesterolemia and healthy subjects

A Pavlidis, G Kolovou, K Anagnostopoulou, P Petrou, K Sorodila, A Valaora, K Salpea, D Cokkinos

Onassis Cardiac Surgery Center, Athens, Greece

Topic: Lipids and atherosclerosis

Purpose: Familial combined hyperlipidemia (FCH) is the most common familial dyslipidemia among patients who suffer early myocardial infarction. Familial hypercholesterolemia (FH) is a monogenic disorder of lipid metabolism secondary to low density lipoprotein receptor mutations that has been strongly linked to premature coronary artery disease (CAD). Postprandial hypertriglyceridemia is also associated with CAD. The purpose of this study was to evaluate postprandial lipemia after an oral fat tolerance test (OFTT) in men with FCH and compare them to FH and healthy subjects.

Methods: The study population consisted of 83 subjects. OFTT was given to 34 men with FCH, 29 men with FH and 20 healthy men. The FCH and FH groups were further divided according to the lipid phenotype, on the basis of Fredrickson's classification, into five subgroups: FCH IIA ($n = 13$), FCH IIB ($n = 10$), FCH IV ($n = 11$), FH IIA ($n = 21$) and FH IIB ($n = 8$). TG concentrations were measured before, 2, 4, 6 and 8 h after OFTT and the postprandial response was evaluated by the areas under the curve (AUC) for TG concentrations.

Results: The TG levels after OFTT were significantly higher in FCH compared to FH and healthy groups (AUC in mg/dl/h: 2678 ± 1415 vs. 1503 ± 1147 and 1011 ± 652 respectively, $p < 0.001$). The postprandial TG levels were significantly increased in FCH IV and FCH IIB groups compared to FCH IIA (AUC in mg/dl/h: 3220 ± 824 vs. 3409 ± 770 and 1863 ± 577 respectively, $p < 0.001$). FCH IIA group demonstrated higher TG levels at 2, 6 and 8h, compared to FH IIA group ($p = 0.05$, $p = 0.017$ and $p = 0.013$ respectively). There were no significant differences between FH IIB and FCH IIB subgroups.

Conclusions: FCH and FH patients demonstrate an exaggerated postprandial response, that could partially contribute to the high cardiovascular risk. This abnormal response is even more pronounced in FCH subjects with a mixed lipid phenotype. These patients should be identified early and treated with the appropriate hypolipidemic regime.

(W) P349

Castelli risk index updated. Correlation between apolipoprotein B/apolipoprotein A1 and total cholesterol/HDL-cholesterol ratios in a healthy population

DA Siniawski, WM Masson, P Sorroche, W Scordo, L Casanas, J Krauss, AM Cagide

¹Italian Hospital of Buenos Aires, Buenos Aires, Argentina

Topic: Lipids and atherosclerosis

Background: Total cholesterol/HDL-cholesterol ratio (TC/HDLr) was proposed as a coronary risk marker approximately 25 years ago by Dr. W. Castelli and the goal suggested was < 4.5 . Recent studies demonstrated that apolipoprotein B/apolipoprotein A1 ratio (ApoB/ApoAr) is an independent coronary risk predictor. For various reasons, many patients can not access to apolipoprotein measurements. Objectives: Determine in a healthy population from Argentina TC/HDLr values corresponding to the decile 1 of the ApoB/ApoAr (0.43, odds ratio 1.00) in the INTERHEART study (IH). Suggest updated TC/HDLr goals to improve coronary risk categorization and targets in patients with high vascular risk.

Methods: Apolipoprotein levels were measured by kinetic nephelometry in samples obtained from blood givers. Correlations between ApoB/ApoAr and TC/HDLr were assessed. Two linear regression analyses models were performed for ApoB/ApoAr versus TC/HDLr: in the total population and in the very low risk subpopulation (sP) composed of non-smoking subjects with a body mass index < 25 . ROC analysis was done to assess the accuracy of the Castelli index to discriminate between subjects with ApoB/ApoAr $>$ or $= 0.43$. People with diabetes, hypertension, cardiovascular disease, or receiving lipid-lowering drugs were excluded.

Results: 283 subjects were included. Men: 64%, smokers: 31%, with ApoB/ApoAr > 0.43 : 82%. General characteristics (mean \pm SD): age: 42 ± 14 years, BMI 26 ± 4 , TC 199 ± 40 mg/dL, HDL-C: 49 ± 13 mg/dL, TC/HDLr: 4.31 ± 1.28 , ApoB: 95.2 ± 28 mg/dL, ApoA: 157.6 ± 31 mg/dL, ApoB/ApoAr: 0.62 ± 0.21 . Correlations between ApoB/ApoAr and TC/HDLr in the total population and sP were: 0.90 and 0.91 respectively. In the linear regression models ApoB/ApoAr value of 0.43 (decile 1 of IH) corresponded to a TC/HDLr of 3.22 and 3.17 in the total population and sP respectively. The AUC for the TC/HDLr for detecting an ApoB/ApoAr > 0.43 was 0.936 (95% CI 0.897-0.975) and the optimal cut-off point 3.24 (sensitivity 91%, specificity 84%, positive predictive value 96%, negative predictive value 68%).

Conclusions: These results suggest that the Castelli index goal < 4.5 should be revised and updated to < 3.2 . This target resembles the TC/HDLr observed in the decile 1 of the IH study.

P350

Lipid profile of Spanish patients with coronary heart disease treated with statins. Dyslipidemia International Study (DYSIS-SPAIN)JR Gonzalez-Juanatey¹, C Guijarro², E Alegria³, JV Lozano⁴, B Gonzalez-Timon⁵, E Gomez-Salinas⁵, G Vitale⁵, J Millan⁶¹University Clinical Hospital of Santiago de Compostela, Santiago de Compostela, Spain,²Hospital Fundacion Alcorcon, Madrid, Spain, ³University Clinic of Navarra, Pamplona, Spain, ⁴Health Centre Serreria 2, Valencia, Spain, ⁵Merck Sharp Dohme, Madrid, Spain⁶University Hospital General Gregorio Maranon, Madrid, Spain**Topic: Lipids and atherosclerosis**

Introduction: LDL-C is the therapeutic target for cardiovascular prevention and the NCEP ATP III guidelines recommend statins to reduce LDL-C levels. Patients with coronary heart disease (CHD) are considered as high cardiovascular risk; therefore they have a lower LDL-C target. Some studies have found that low HDL-C and high triglycerides (TGs) may have a role in coronary risk but statins have limited action on them. The aim of this analysis was to describe the lipid profile of Spanish statin-treated patients with coronary heart disease (CHD).

Methods: Analysis of 3710 Spanish patients included in DYSIS, a cross-sectional study carried out with 22063 participants in Europe and Canada, on patients = 45 year-old treated with statins for at least 3 months. Data were recorded from patient's clinical charts. We used the ATP-III recommendations to classify patient's risk and define the LDL-C goal and normality or not of the HDL-C and triglycerides concentrations.

Results: In 3710 patients (median age 65.0 year-old, 47.3% women, 69.0% with hypertension, 39.0% with diabetes mellitus), 23.8% were diagnosed with CHD (68.0% men, 27.6% women, $p<0.001$); in this subpopulation 75.1% were hypertensive, 44.8% were diabetics, 16.8% were smokers and 25.6% had a family history of premature CHD. LDL-C was not at goal in 46.9% of patients with CHD vs. 51.4% of patients without CHD ($p<0.05$). The prevalence of low HDL-C (<40 mg/dl [men], <50 mg/dl [women]) was 34.9%, higher compared to patients without CHD (29.8%, $p<0.001$) and TGs were elevated in 35.1% comparing to 38.4% in patients without CHD. Lipid profiles were abnormal in 8.2% of CHD patients.

Conclusions: In this analysis of coronary heart disease patients, despite better control of LDL-C and TGs than the total Spanish population of the study, almost 50% of CHD patients do not reach LDL-C target; the prevalence of low HDL-C in these patients is significantly higher and one third show high TGs. A considerable number of CHD patients had an abnormal lipid profile; as a result it may be of interest to explore new therapies in order to reach LDL-C goal which may prevent cardiovascular disease with an integrated approach to other lipid risk factors as low HDL-C and high TGs.

P351

Prevalence of low HDL-C in statin treated patients with cardiovascular disease. The Dyslipidemia International Study (DYSIS-SPAIN)E Alegria¹, J Millan², C Guijarro³, JV Lozano⁴, E Gomez-Salinas⁵, B Gonzalez-Timon⁵, G Vitale⁵, JR Gonzalez-Juanatey⁶¹University Clinic of Navarra, Pamplona, Spain, ²University Hospital General GregorioMaranon, Madrid, Spain, ³Hospital Fundacion Alcorcon, Madrid, Spain, ⁴Health CentreSerreria 2, Valencia, Spain, ⁵Merck Sharp and Dohme, Madrid, Spain ⁶University Clinical

Hospital of Santiago de Compostela, Santiago de Compostela, Spain

Topic: Lipids and atherosclerosis

Background and objective: Secondary prevention pretends to reduce cardiovascular (CV) events and to achieve it; multiple risk factors should be controlled as hypertension, obesity, diabetes or dyslipidemia. LDL-C is the usual target to treat dyslipidemia, but HDL-C has demonstrated to be a CV risk factor especially on coronary heart disease. The aim of this post-hoc analysis was to assess the prevalence of low HDL-C levels in statin treated patients with cardiovascular disease (CVD) included in DYSIS study.

Methods: Analysis of 3.710 Spanish patients included in DYSIS, a cross-sectional study carried out with 22.063 participants in Europe and Canada, on patient's = 45 year-old treated with statins for at least 3 months. Data were recorded from patient's clinical charts. We used the ATP-III recommendations to classify patient's risk and define the LDL-C goal and normality or not of the HDL-C and triglycerides concentrations.

Results: In 3710 Spanish patients (median age 65.0 year-old), 35.7% had established CVD (62.1% men and 34.0% women; $p<0.001$), of those 76.3% were hypertensive, 45.4% diabetics, 17.6% smokers and 24.6% had family history of premature coronary heart disease (CHD). LDL-C was not at goal in 51.1% of CVD patients vs 49.9% of non-CVD patients. The prevalence of low HDL-C (<40 mg/dl [men], <50 mg/dl [women]) was 35.7% and it was higher than in patients without CVD (26.4%, $p<0.001$) and 36.8% had elevated TG (≥ 150 mg/dL) comparing to 38.2% in patients without CVD. The lipid profile was abnormal on 10.4% of CVD patients and it was significantly higher in women than men (14.3% vs 8.4%, $p=0.01$).

Conclusions: At this analysis, almost 50% of patients with CVD do not achieve LDL-C goal, despite statin treatment and a considerable amount show an abnormal lipid profile. Low HDL-C could be an important cardiovascular risk factor as the prevalence of HDL-C is higher on patients with cardiovascular disease. Treatment of low HDL-C added on statin therapy may help to prevent the development of cardiovascular events.

P352

Family history of premature myocardial infarction is associated with higher blood pressure in middle aged womenJ Pitha¹, M Lejskova², P Stavek¹, S Zecova³¹Institute of Clinical and Experimental Medicine, Prague, Czech Republic, ²Institute forPostgraduate Medical Education, Prague, Czech Republic, ³Charles University Prague, 1st

Faculty of Medicine, Prague, Czech Republic

Topic: Hypertension

Background: Many candidate genes for cardiovascular diseases are now intensively investigated. Nevertheless, family history is still one of the most important cardiovascular risk factors. We analyzed the impact of family history of premature myocardial infarction on cardiovascular risk factors in middle aged women.

Methods: Women aged 45-54 years representing 5% of population sample ($n=883$) underwent complete evaluation of cardiovascular risk factors. Positive family history was defined as a history of fatal/nofatal myocardial infarction in father before age of 60 and/or in mother before age of 65 years. Differences between these two groups were analyzed by unpaired t-test or by χ^2 test (STATa).

Results: We found strong evidence, that women with positive family history ($n=77$) were more frequently treated for hypertension than women with negative family history ($n=806$) (40 vs. 27%; $p=0.018$); had substantially higher systolic and diastolic blood pressure (123.5 \pm 18.0 vs. 118.5 \pm 18.0; $p=0.009$ and 82.1 \pm 10.0 vs. 78.5 \pm 10.0 mmHg; $p=0.002$); we also found weak evidence, that they had slightly higher plasma non-HDL cholesterol (4.1 \pm 1.1 vs. 3.9 \pm 0.9 mmol/l; $p=0.066$) and apolipoprotein B (1.1 \pm 0.3 vs. 1.0 \pm 0.2 g/l; $p=0.055$). No other risk factors, including age, smoking behavior, history of diabetes, body mass index, waist circumference, glycaemia, C-reactive protein and other plasma lipids were associated with positive family history.

Conclusion: Family history of premature myocardial infarction was strongly associated with hypertension and blood pressure and weakly with non-HDL cholesterol and apolipoprotein B in middle aged women.

P353

Do particular types of left ventricular hypertrophy influence the duration and dispersion of QT interval in hypertensive patients?J Kunisek¹, L Zaputovic², Z Cubranic², L Kunisek², V Persic¹, A Ruzic¹, M Zuvic Butorac³, S Vuckovic Rapalic¹¹Thalassotherapy Opatija, Opatija, Croatia, ²Clinical Hospital Center Rijeka, Rijeka, Croatia,³University of Rijeka, Technical Faculty, Rijeka, Croatia**Topic: Hypertension**

Aim: The greater excitability of concentric and eccentric LVH types is a known fact. We sought to investigate the possible electrophysiological background (QT intervals and dispersion) of that phenomenon particularly in relation to the asymmetric type.

Methods: During the 5.5 years, 158 patients (70 men) with essential hypertension and without clinical evidence of ischaemic heart disease were included in the study according to prespecified criteria. All medication was discontinued 48 hours before exercise testing and Holter monitoring. Patients were divided into three groups with regard to LVH type: concentric (RWT >0.45 and IVS/LVPW ≥ 1.3), eccentric (LVISd >32 and RWT <0.45), asymmetric (IVS/LVPW >1.3), and three subgroups according to the degree of LVH: mild (IVS or LVPW 11-12 mm), moderate (IVS or LVPW 13-14 mm) and severe (IVS or LVPW ≥ 15 mm). An upper normal limit for QTc interval was 420 ms for men and 430 ms for women; for QT dispersion it was 70 ms.

Results: The mean values of QT and QTc interval were borderline (380.6 \pm 47.3 ms and 425.0 \pm 34.4 ms, respectively), while the QT dispersion was normal (34.5 \pm 19.1 ms). The QTc interval and QT dispersion were increased in severe concentric and eccentric LVH (443 and 480 ms for QTc; 53 and 45 ms for QTd, respectively), but not significantly. QT dispersion in men with severe LVH was significantly enlarged (67.5 vs. 30 ms, $p=0.047$). The QT interval was significantly longer in patients with complex ventricular arrhythmias ($p=0.037$).

Conclusion: QTc interval and QT dispersion tend to increase proportionally to the left ventricular mass only in the concentric and eccentric type of LVH. This could explain the greater arrhythmogenicity of the concentric and eccentric in relation to the asymmetric LVH type.

P354

Acute and long-term effects of different intensity of exercise on blood pressure of hypertensive patients with chronic heart failure

G Caminiti, M Volterrani, A Cerrito, ME Lippi, B Sposato, A Franchini, A Arisi, G Rosano

IRCCS San Raffaele Pisana Hospital, Rome, Italy

Topic: Hypertension**Background:** To evaluate if interval training (IT) is more effective than endurance training in improving exercise capacity blood pressure (BP) and heart rate of hypertensive subjects with chronic heart failure (CHF)**Methods:** We enrolled 36 (M/F 22/14) CHF patients (NYHA class II) median age 62 ± 7 ys. They were divided into 2 groups according to the exercise protocol. Group IT (20 patients): interval training (exercise between 50% and 80% of VO2 peak); group ET (16 patients) endurance training (exercise at 60% VO2 peak). The follow up period was 12 weeks. At baseline and 12 weeks patients underwent a cardiopulmonary test. A twenty-four hour ambulatory BPs was performed after the first and the last session of the exercise protocol.**Results:** After the first exercise session there were not significant between groups differences on daytime and nighttime systolic BP and diastolic BP. After 12 weeks of training VO2 peak increased in both groups in a similar manner (IT +13; ET +11%; p 0.18). ET group had a greater increase of time of exercise (+173 sec vs +112 sec; p 0.03) than ET group. ET had a lower reduction of rest heart rate (-4 bpm vs -9 bpm) and a lower improvement of heart rate recovery at 1 minute (-6.2 bpm vs -11.3 bpm; p 0.01) After the last session IT group had a greater reduction of daytime (-16% vs 7 ; p 0.02) and nighttime (-19% vs 8 ; p 0.006) diastolic blood pressure, and lower daytime (-12% vs 9 ; p 0.07) and nighttime (-13% vs 6 ; p 0.002) heart rate than ET group.**Conclusions:** IT seems to determine greater effects on exercise capacity and blood pressure control in hypertensive patients with CHF.

P355

Metabolic disorders in patients with arterial hypertension (AH) and metabolic syndrome (MS) depending on blood pressure (BP) and intima-media thicknessO Rekovets, YM Sirenko, SY Savitskiy, EA Pavlyuk, AS Vaschylko, GF Primak
National Scientific Center "M.D. Strazhesko Institute of Cardiology, MAS of Ukraine", Kiev, Ukraine**Topic: Hypertension****Background:** It is not clear relation ship between degrees of manifestation insulin resistance and increased blood pressure and atherosclerosis in patients with arterial hypertension (AH) and metabolic syndrome (MS).**Objection:** to evaluate the changers of some characteristics of insulinsensitivity in patients with AH and MS and intima-media thickness and increased blood pressure.**Methods:** We studied on 124 patients (52 men and 72 women) with average age 50.3 ± 1.0 years old with mild to moderate AH and clinical signs of MS (according to ATP III), patients with diabetes mellitus were excluded from the study. All patients were performed oral glucose tolerance test (OGTT) with estimation of serum glucose and insulin level and calculation of HOMA index, the total cholesterol, triglycerides (TG), HDL cholesterol determination, calculated body mass (BMI index), measured office BP, and ABMP (Ambulatory Blood Pressure Monitoring) estimated intima-media thickness (IMT).**Results:** 36 patients (29%) had insulin resistance (IR) with HOMA > 3 . 88 patients (71%) had not insulin resistance (HOMA < 3). Patients with HOMA > 3 had higher BMI 34.60 ± 0.82 kg/m² than patients without IR 32.21 ± 0.40 kg/m² ($p < 0.001$). Patients who had insulin resistance had higher BP than who did not have insulin resistance: office SBP 157.72 ± 1.56 vs 156.16 ± 0.91 mmHg, $p < 0.001$, office DBP 92.06 ± 0.60 vs 91.22 ± 0.38 mmHg, $p < 0.01$. ABMP SBP 135.79 ± 2.12 vs 133.94 ± 1.33 mmHg, $p < 0.001$, DBP 81.22 ± 1.45 vs 80.45 ± 0.98 mmHg. Patients with IR had higher cholesterol and TG and HDL less than patients without IR: cholesterol 6.79 ± 0.15 vs 6.23 ± 0.12 mmol/l, $p < 0.01$, TG 2.12 ± 0.20 vs 1.71 ± 0.60 mmol/l, $p < 0.01$, HDL level 1.13 ± 0.03 vs 1.19 ± 0.02 mmol/l, $p < 0.01$. Patients with IR had more aggressive atherosclerosis compared without IR patients. Patients with HOMA > 3 had IMT 1.52 ± 0.01 vs 1.27 mm, $p < 0.01$, who had HOMA < 3 .**Conclusions:** Patients with AH and insulin resistance had higher body mass index, office blood pressure and BP during ABMP, level of cholesterol, triglycerides, intima-media thickness (IMT) and less HDL cholesterol compared patients without insulin resistance.

P356

Plasma brain natriuretic peptide: a biochemical marker of effective blood pressure management in pregnancyA Ascione¹, F Stoppoloni¹, G Verneti¹, A Sciarappa¹, M Borgia²¹Buon Consiglio Fatebenefratelli Hospital, Naples, Italy, ²Vincenzo Monaldi Hospital, Naples, Italy**Topic: Hypertension****Objective:** To investigate plasma brain natriuretic peptide (BNP) concentrations in association with blood pressure (BP) in pregnant women at baseline and after antihypertensive drug treatment.**Patients and methods:** We prospectively examined 86 women with newly diagnosed essential hypertension without target organ damage by blood pressure holter monitoring, whose mean age was 27.7 ± 10.9 years. They were before three months gone with child. Mean blood systolic/diastolic pressure in 24 hours was $146.5/98.8$ mmHg. Treatment initiation began with metildopa 250 mg/bis in day and was doubled at 4 weeks in cases of inadequate BP control. If indicated, at 8-week-follow-up metildopa 500 mg/bis in die alone or with nifedipine 30 mg was added. BNP levels were measured at baseline and after 2 months of antihypertensive treatment.**Results:** At baseline plasma BNP levels were found to be related to systolic BP ($r = 0.27$, $P < 0.001$), independent of age, weight, smoking status, and left ventricular mass index estimated by echocardiography ($P = 0.002$). Additionally, higher BNP concentrations were observed in patients with stage 2 hypertension compared with those with stage 1 (median 34.9 vs. 25.9 pg/ml, $P = 0.022$). Multivariate analysis showed a positive association between BNP and systolic BP variability ($P = 0.034$). At follow-up, 60.1% of the participants who had achieved BP control showed decreased BNP levels in contrast to those with poor BP control (median change -14.5 vs. -1.3 and median range from -34.4 to -4.4 vs. -9.6 to 10.9 , respectively, $P < 0.001$).**Conclusion:** In this hypertensive population of pregnant, increased BNP concentrations are associated with higher BP levels and systolic BP variability. The fall of BNP observed in those who achieved BP control indicates that BNP could be used as a biochemical marker of effective BP control and target organ protection

P357

Correlations between the metabolic syndrome and other cardiovascular risk factors on the outcome of hypertensive patientsE Belu¹, R Musetescu¹, A E Musetescu², V Belu³, D -D Ionescu¹, V Mechirova⁴¹Cardiology Center, Craiova, Romania, ²University of Medicine and Pharmacy of Craiova, Craiova, Romania, ³Cardiology Depart., Campulung, Romania, ⁴University of Medicine, Kosice, Slovak Republic**Topic: Hypertension****Purpose:** The metabolic syndrome (MS) includes several interrelated cardiovascular risk factors that have been shown to increase the risk of heart disease. Taking into account the numerous cases of patients suffering from hypertension and metabolic syndrome (MS) in this area and the short data regarding the profile of the romanian hypertensive patient, we have propounded to assess the risk profile for these patients.**Method:** We have included in the study group patients admitted in Craiova Cardiology Center in 2007 from the County registry of hypertension and we have divided them in 2 subgroups: individuals with hypertension and metabolic syndrome according to NCEP criteria and the second subgroup of hypertensives without metabolic syndrome. The follow-up period lasted for two years. We performed multivariate logistic regression analyses in order to assess the relationships between hypertension, metabolic syndrome, target organ disease, dyslipidemia, visceral obesity and diabetes mellitus.**Results:** We have evaluated 542 patients with metabolic syndrome and hypertension mean age of 55.12 years. There were 48,72% men and 51,28 % women. The risk of end stage renal disease was estimated at 2,56%. The profile of our MS patients was depicted by older age, higher systolic pressure, higher body mass indexes. The percent of patients with diabetes mellitus was 34,19%, but 27,35% from them had impaired fasting glucose. This population had more left ventricular hypertrophy, renal and cardiac diseases were more prevalent ($p < 0.01$), and they received more antihypertensive drugs ($p < 0.05$). There were only 17,09% from our patients who achieved the target values of blood pressure.**Conclusions:** The study shows the poor adherence to treatment of hypertensive patients with metabolic syndrome. These patients are achieving the target values for blood pressure in a very small percent. The number of important cardiovascular events is increased in the case of these young patients with a very high risk profile.

P358

Trends in threshold SBP and its impact on mortality in the hypertensive patients in 25 years of follow-up

UO Andersen, GB Jensen

*Copenhagen City Heart Study, Copenhagen, Denmark***Topic: Hypertension**

Aims: To evaluate trends in threshold SBP (the SBP-value before start of antihypertensive therapy) and to evaluate the impact of threshold SBP on mortality.

Design and methods: Copenhagen City Heart Study is a prospective longitudinal epidemiological study. The study population consists of subjects that in the next survey start antihypertensive therapy. The subjects were followed over 25 years with 1 to 4 measurements on each subject. The BP measurement was fully standardised and measurement method was unchanged throughout the observation period. A questionnaire concerning risk factors and medical therapy exercise was completed by the participants and double-checked by the technicians. Data were analysed by random effect model for trends and by Cox analysis.

Results: Threshold SBP did not change during 25 years of follow-up. Men, obese and elderly started antihypertensive therapy at a higher threshold value than their counterparts. Mortality increased by increasing threshold value.

Conclusion: Hypertensive patients that start treatment on low SBP-values survive better than the patients that start antihypertensive treatment on high SBP values. In the past 25 years threshold SBP has not decreased. It is essential to start antihypertensive therapy earlier if we want to improve life expectancy in the hypertensive population.

P359

The relationship between the sleep quality and blood pressure values before and after therapy with rilmenidine

S Farsky, R Sidlo

*Slovak League against Hypertension, Martin, Slovak Republic***Topic: Hypertension**

The study was aimed at determining a potential correlation between the morning values of blood pressure and the sleep quality during the previous night in patients with fixed hypertension treated with medicaments, and at finding whether a therapy with rilmenidine has positive effects not only on the value of blood pressure, but also improves the sleep quality through decrease in the sympathetic activity.

We have examined 993 patients with essential hypertension, that have not reached the target values of blood pressure in spite of a therapy with medicaments, and the abdominal obesity was found in 79% of the patients. The therapy with rilmenidine was added to their previous treatment, and the study duration was 3 months. At the beginning and at the end of the study, there were performed anthropometric and basic biochemistry examinations, a repeated measurement of the blood pressure and heart rate in 10 min intervals in outpatient departments of general practitioners, as well as an evaluation of the sleep quality according to the Athens Insomnia Scale questionnaire.

After adding rilmenidine to their hypertension therapy, there was found a decrease in systolic pressure, diastolic pressure, heart rate and sleep quality. The decrease was highly significant ($p < 0.0001$). The coefficients of correlation between the systolic blood pressure values and the sleep quality were 0.08 ($p < 0.0226$) at the beginning of the study and 0.14 ($p < 0.0001$) at the end of the study, and were 0.08 ($p < 0.015$) between the diastolic blood pressure values and the sleep quality at the end of the study. The coefficients of correlation between a difference of the systolic blood pressure values and a difference between results of the questionnaire at the beginning and the end of the study were -0.09 ($p < 0.0064$).

Results of our study acknowledged a positive effect of rilmenidine in hypertension therapy due to a significant decrease of the blood pressure, slowing the heart rate and improvement of the sleep quality evaluated by the standardized questionnaire. In addition, interesting associations were found between the sleep quality and values of the systolic blood pressure, and partly also diastolic blood pressure before the start of therapy with rilmenidine and during the therapy. These results are in concordance with the actual literature data that demonstrated that a decreased length and an impaired quality of sleep have a negative effect on blood pressure values and occurrence of hypertension as well as the overall cardiovascular risk in adolescent and adults persons.

P360

High prevalence of prehypertension and hypertension among young and middle-aged bank employees in HungaryS Steiner¹, E Helis¹, JG Fodor¹, P Turton¹, S Sonkodi², B Sonkodi²¹University of Ottawa Heart Institute, Ottawa, Canada, ²SZTE, AOK, I. Belgyógyászati Klinika, Szeged, Hungary**Topic: Hypertension**

Purpose: Hungary has one of the highest mortality rates due to strokes among the European Union countries. As elevated blood pressure (BP) is the principal risk factor for strokes, we assessed BP levels in a sample of working population in Budapest, Hungary.

Methods: 1000 bank employees (mean age \pm SD = 32.5 \pm 8.1) were screened for their BP and other CV risk factors at their worksite. The respondents included 304 males (mean age \pm SD = 30.9 \pm 6.4) and 696 females (mean age \pm SD = 33.2 \pm 8.9). Respondents were classified as normotensives, prehypertensives (PHTN) and hypertensives (HTN) according to their BP levels. The BP and heart rate (HR) were measured using an automated instrument. Body height, body weight and waist circumference (WC) were measured and BMI was calculated. Self-reported information regarding smoking was recorded. Group comparisons were made by ANOVA followed by Tukey's post hoc test.

Results: 46% of respondents were identified as PHTN (systolic blood pressure (SBP) between 120-139 mmHg or diastolic blood pressure (DBP) between 80-89 mmHg) and 17.3% as HTN (SBP = 140 mmHg and/or DBP = 90 mmHg and/or on hypertensive medications). A progressive and significant increase in HR, WC and BMI was ascertained as BP levels increased (see Table). Interestingly, no age difference was found between normotensives and PHTN, while HTN individuals were significantly older. Almost a third (29%) of all respondents were smokers.

Conclusions: The high prevalence of elevated BP and smoking might provide a partial explanation for the excessive stroke mortality and unfavourable cardiovascular profile of Hungary as compared with other European countries.

Participant characteristics

Blood Pressure Class	Normotension	Prehypertension	Hypertension
N (%)	368 (36.8%)	459 (45.9%)	173 (17.3%)
Age, years	31.7 \pm 7.7	31.7 \pm 7.4	36.3 \pm 9.7 *#
Waist Circumference, cm	75.6 \pm 9.8	78.8 \pm 11.3*	86.4 \pm 14.1*#
BMI, kg/m ²	22.3 \pm 3.2	23.1 \pm 3.3*	25.1 \pm 4.5*#
SBP, mmHg	108.5 \pm 7.9	124.7 \pm 6.4*	139 \pm 15.5*#
DBP, mmHg	70.1 \pm 6.4	80 \pm 6.4*	92.5 \pm 9.6*#
Heart Rate, bpm	73.5 \pm 10.1	78.3 \pm 11.3*	84.4 \pm 13.4*#

All data are shown as mean \pm SD.* $P < 0.0001$ for comparison against normotensives.# $P < 0.0001$ for comparison of PHTN vs. HTN.

P361

The influence of depression disorders on the blood pressure in adolescents

V Romero, J Villasmil, E Silva, G Bermudez

*Instituto de Enfermedades Cardiovasculares, Maracaibo, Venezuela***Topic: Psychosocial factors and stress**

Objective: To determine the effects of depression on the blood pressure (BP) in adolescents. **Methods:** This study was carried out in a random sample of schools from Maracaibo, Venezuela. The participants were 560 adolescents, males (n=310) and females (n=250), age-mean = 14.19 years (SD=1.52), who were systolic and diastolic BP recorded in two schools day, in sitting position and using oscillometric method (Dinamap). The adolescents completed the Zung self-rating depression scale to assess depression symptoms, and they were classified according the result of this scale in 3 categories: Normal (N), Minimum Depression (MiD) and Moderate Depression (MoD). **Statistics Methods:** The data are presented as mean \pm standard deviation. The One-way ANOVA was used to study the effects of the different depression categories on the BP levels, and the Tukey test was applied for the mean comparisons.

Results: The prevalence of MoD was 8.2% (n=46) and it was 28.2% (n=158) for MiD in all subjects. The systolic/diastolic BP values were: 103.1 \pm 10.3/57.6 \pm 5.6 mmHg in adolescents with MoD, 106.8 \pm 12.2/60.7 \pm 6.9 mmHg in subjects with MiD and 108.6 \pm 12.2/60.5 \pm 6.7 mmHg in N adolescents. The ANOVA showed statistically significant effects of the depression disorders on both systolic BP ($F = 4.816$) and diastolic BP ($F = 4.384$). The analysis post hoc evidenced systolic and diastolic BP values statistically lower in adolescents with MoD than those with MiD ($p < 0.01$) or N ($p < 0.01$).

Conclusions: The present results provide evidence for an association between depression disorders and low BP in the adolescent population. This study do not evaluated the mechanism behind the findings; however, it is possible that there is a relationship between symptoms of depression and some indications of abnormal autonomic nervous function; this abnormality would explain the low BP. More investigations are needed to explore these associations in adolescents.

P362**Correlates of nondipping blood pressure pattern among middle-aged men and women**E Clays¹, D De Bacquer¹, K Van Herck¹, M De Buyzere², M Kornitzer³, F Kittel³, G De Backer¹¹Ghent University, Ghent, Belgium, ²Ghent University Hospital, Ghent, Belgium, ³Free University of Brussels (ULB), Brussels, Belgium**Topic: Cardiovascular epidemiology**

Purpose: There is a growing body of evidence suggesting that nondipping (i.e. a lack of nocturnal blood pressure (BP) fall) has prognostic value for cardiovascular disease (CVD). Knowledge of the underlying mechanisms and associative factors is still incomplete. Some socio-demographic and behavioral factors have been shown to correlate with nondipping, while very little is known about psychosocial correlates. The aim of this study was to examine correlates of nondipping in a sample of healthy middle-aged workers.

Methods: Results are based on observations in 170 day-time workers (60% male, mean age 51 years) from the Belstress II study with no history of CVD. Socio-demographic (gender, age, educational level), behavioral (smoking status, alcohol consumption, physical activity, sleep pattern) and psychosocial factors (job stress according to the Demand-Control model, and symptoms of depression, anxiety and vital exhaustion based on the CES-D scale) were assessed by means of questionnaires. Height and body weight were measured during standardized bioclinical examinations. On a regular working day, participants wore an ambulatory BP monitor (Spacelabs Medical) during 24 hours. Nondipping was defined as a decline from wake to sleep BP of less than 10%. Associations were studied by multiple logistic regression analysis.

Results: Nondipping in systolic blood pressure (SBP) was present in 22% and nondipping in diastolic blood pressure (DBP) in 9% of the study sample. The prevalence of nondipping was higher in females, lower educated and obese persons. After adjusting for gender, educational level and body mass index, the risk for nondipping in SBP was (borderline) significantly increased by high symptoms of depression (OR = 2.25; 95% CI = 0.97-5.23), anxiety (OR = 3.32; 95% CI = 1.43-7.72) and vital exhaustion (OR = 2.24; 95% CI = 0.89-5.60), while nondipping in DBP was (borderline) significantly related to sleep problems (OR = 2.68; 95% CI = 0.85-8.40), job strain (defined as the ratio of demands over control) (OR per 1 SD in job strain = 1.74; 95% CI = 1.10-2.77), high symptoms of depression (OR = 2.83; 95% CI = 0.90-8.94) and vital exhaustion (OR = 2.99; 95% CI = 0.90-9.96). No associations were found with age, smoking, alcohol consumption and physical activity.

Conclusions: This study found that nondipping was associated with female gender, lower educational level, obesity, sleep problems, job strain, and symptoms of depression, anxiety and vital exhaustion in a sample of middle-aged workers. The role of psychosocial factors should be considered when examining nondipping.

P364**Factors associated with prediabetes in adult children of patients with premature coronary heart disease; the study of families of patients with premature coronary heart disease**

MV Konnov, LM Dobordzhigizde, AD Deev, NA Gratsiansky

Institute of Physico-Chemical Medicine, Moscow, Russian Federation

Topic: Diabetes

Objective: To elucidate associations of impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT) in adult children of patients with premature coronary heart disease (CHD) and/or elevated low density lipoprotein cholesterol (LDL-C) with some of their own characteristics and those of their parents.

Methods: We examined members of 210 families of patients with premature CHD (91.4%) and/or with LDL-C ≥ 3.36 mmol/l including 136 consorts of patients-probands, and 251 children aged 16-37 years. Children had neither overt vascular disease nor diabetes mellitus (DM). Characteristics analyzed included tobacco smoking, alcohol consumption, oral contraceptives use, height, body mass index, waist circumference, heart rate (HR), systolic/diastolic BP, total and high density lipoprotein cholesterol, LDL-C, triglycerides, serum basal glucose, IFG, IGT, DM (ADA criteria) and (in parents) education level and menses. High BP was defined as prehypertension or hypertension (NHBPEP-4 or JNC-7 depending on age). IFG and IGT of children were combined and designated prediabetes (preDM). Associations were assessed by logistical regression analysis with age, sex adjustment.

Results: PreDM was found in 35 of 251 children (13.9%). DM of neither parent-proband nor of any parent was related to preDM in children. Factors related to the presence of preDM with $p < 0.1$ in univariate analysis (children's high BP, HR, triglycerides, waist circumference, alcohol consumption of proband, and basal glucose, diastolic BP, metabolic syndrome, height and waist circumference of non-proband) were included into stepwise regression procedure. Characteristics independently linked with preDM turned out to be own high BP; basal glucose of non-proband; and own HR (table).

Conclusion: In this group of grown-up children of patients with premature CHD: 1) preDM was not related to DM of their parents; 2) preDM was not related to any studied characteristic of parent with premature CHD; 2) basal glucose of parent - nonproband, and own high BP and HR were independently associated with preDM.

Results of multifactorial analysis

Independent predictors of	OR	95%CI	p
preDM in adult children			
Own high BP	2.954	1.706 - 5.115	0.0001
Top tertile of basal glucose of non-proband (≥ 5.37 mmol/l)	5.183	1.722 - 15.60	0.003
vs 2 bottom tertiles (< 5.37 mmol/l)			
Top tertile of own HR (≥ 75 beats per minute) vs bottom tertile (≤ 66 beats per minute)	3.361	1.253 - 9.018	0.016

P365**Risk factors for cardiac autonomic neuropathy in diabetes and the significance of a multifactorial intervention for its prevention**C Voulgari¹, A Psallas¹, A Kokkinos¹, V Argiana¹, I Moyssakis², D Perrea³, N Katsilambros¹, N Tentolouris¹¹First Department of Propaeutic Medicine, Athens University Medical School, Laiko General Hospital, Athens, Greece, ²Laiko General Hospital, Department of Cardiology, Athens, Greece, ³Laboratory for Experimental Surgery and Surgical Research, Athens University Medical School, Athens, Greece**Topic: Diabetes**

Purpose: Cardiac autonomic neuropathy (CAN) is a common diabetes complication and confers an increased cardiovascular risk. Literature data on the association between CAN with clinical and metabolic correlates in diabetic subjects are limited, especially in type 2 diabetes. We aimed to examine the relationship between CAN with clinical and metabolic parameters, and other diabetes complications.

Methods: We consecutively recruited 1000 diabetic subjects (type 1 diabetes=400; type 2 diabetes=600). Participants with overt nephropathy, and macrovascular complications were excluded. CAN was diagnosed when two out of the four classical autonomic function tests were abnormal.

Results: In type 1 diabetes, multivariate logistic regression analysis, after adjustment for gender, age, central fat distribution, diabetes duration and lipids demonstrated that the odds (OR, 95% confidence intervals) of CAN increased with factors such as pubertal diabetes onset [1.08 (1.03-1.24), $P < 0.001$], higher central fat distribution [1.36 (1.01-2.02, $P = 0.03$], higher blood pressure [1.16 (1.03-1.05), $P = 0.01$], HbA1c [1.69 (1.07-2.76), $P = 0.02$] and fasting glucose levels [1.01 (1.00-1.01), $P < 0.001$], higher LDL-cholesterol [1.01 (1.00-1.02), $P = 0.03$] and triglycerides levels [1.58 (1.24-1.48), $P = 0.03$], microalbuminuria [1.24 (1.12-1.36), $P = 0.02$], retinopathy [1.13 (1.04-1.41), $P = 0.01$] and smoking [1.10 (1.02-1.40), $P = 0.02$]. The same analysis in patients with type 2 diabetes, after adjustment for gender, age, blood pressure, lipids, and antidiabetic treatment demonstrated that central fat distribution [1.08 (1.00-1.39), $P = 0.02$], longer diabetes duration [1.20 (1.09-1.34), $P = 0.006$], higher HbA1c [1.19 (1.02-1.38), $P = 0.02$], fasting glucose [1.21 (1.12-1.31, $P = 0.002$], LDL-cholesterol [1.35 (1.04-1.75), $P = 0.02$], triglycerides levels [1.30 (1.00-1.68), $P = 0.03$], microalbuminuria [1.20 (1.14-1.36), $P < 0.001$], retinopathy [1.24 (1.16-1.35), $P = 0.008$], smoking [1.22 (1.14-1.49), $P < 0.001$] and smoking severity (> 20 cigarettes/day) [1.32 (1.26-1.64), $P < 0.001$] were independently associated with higher odds of CAN.

Conclusions: In type 1 diabetes, the risk of CAN is associated with pubertal diabetes onset, worse glycaemic control, higher blood pressure levels, and dyslipidaemia, presence of microvascular complications and smoking. In patients with type 2 diabetes the risk of CAN increased with central fat distribution, longer diabetes duration, worse glycaemic control, dyslipidaemia, retinopathy and/or microalbuminuria, smoking and smoking severity. Our findings emphasize the need for a multifactorial intervention for the prevention of CAN in diabetes.

P366**Absence of gender influence on the prognosis of diabetic patients in an outpatient setting, the Barbanza Diabetes Study**

R C Rafael Carlos Vidal Perez, F Otero-Ravina, E Rodriguez Moldes, C De Frutos, L Vaamonde, L Grigorian Shamagian, P Mazon Ramos, JR Gonzalez-Juanatey

University Clinical Hospital of Santiago de Compostela, Santiago de Compostela, Spain

Topic: Diabetes**The Barbanza Diabetes Study group**

Purpose: Previous data have shown that in the patients of male sex, the diabetes mellitus has a lesser impact over the cardiovascular prognosis. The aim of our study was to assess the influence of the gender and prior cardiovascular disease on the prognosis of diabetic patients in an outpatient setting.

Methods: Multicenter prospective cohort study involved 1423 consecutive patients with diabetes mellitus who were recruited by 31 primary care physicians. The patients characteristics were recorded and they were followed up for 45 \pm 10 months.

Results: We studied patients (50% male) with mean age 66 years old. Women were significantly older (67 vs. 64 years, $p < 0.001$) and with more risk factors (64 vs. 53% with more than one, $p < 0.01$) compared with men. Women had less prior cardiovascular disease (24 vs. 29%, $p < 0.05$) or microalbuminuria (32 vs 44%, $p < 0.001$) in this cohort. There were also differences in treatment, women had more renin-angiotensin blockade drugs (60% vs. 50%, $p < 0.01$) and insulin prescribed (20 vs. 11%, $p < 0.001$). At the end of follow up there were no significant differences on cardiovascular mortality (women 2.4% and men 3.7%, $p = 0.354$) or cardiovascular hospital admissions (12.5% vs. 14.8%, $p = 0.351$). On the other hand a greater cardiovascular mortality in patients with prior cardiovascular disease was found (6.1 vs 2.1%, $p < 0.05$), but in this group there were not gender related differences. We adjusted by age, risk factors and treatment this last finding and we didn't find differences between both sexes in the cardiovascular event rate (death, admissions) with a hazard ratio 0.64 (95% confidence interval 0.38-1.08), and neither differences in patients without prior cardiovascular disease were found. The age and microalbuminuria were, in both sexes, the only significant prognosis factors for outcome.

Conclusion: The cardiovascular impact of diabetes is the same in men and women in our outpatient setting; this finding could justify the absence of gender differences in the strategies of cardiovascular prevention in diabetic patients.

P367

Increased ventricular arrhythmogeneity in subjects with type 2 diabetes and cardiac autonomic neuropathy: assessment of the ventricular gradientC Voulgaris¹, I Moyssakis², P Dilaveris³, D Perrea⁴, D Papadogiannis¹, C Stefanadis³, N Tentolouris¹¹First Department of Propedeutic Medicine, Athens University Medical School, Laiko General Hospital, Athens, Greece, ²Laiko General Hospital, Department of Cardiology, Athens, Greece, ³Department of Cardiology, Hippokraton General Hospital, Athens University Medical School, Athens, Greece, ⁴Laboratory for Experimental Surgery and Surgical Research, Athens University Medical School, Athens, Greece**Topic: Diabetes****Purpose:** Cardiac autonomic neuropathy (CAN) is a common diabetes complication associated with dispersion of ventricular repolarization and arrhythmia provocation. QT-prolongation has often been criticized as a poor indicator of ventricular arrhythmogeneity. The spatial QRS-T angle (spQRS-Ta) is a novel vectorcardiographic marker, akin to the concept of the ventricular gradient, a robust index of ventricular electrophysiological heterogeneity and a dominant predictor of cardiovascular morbidity and mortality. We examined differences in the spQRS-Ta in subjects with type 2 diabetes (T2DM) with and without CAN.**Methods:** A total of 232 subjects with T2DM (105 with CAN and 127 without CAN) (age 58.4±9.1 years) and 232 matched (by age and sex) controls were studied. Diagnosis of CAN was based on the classical autonomic function tests. All subjects underwent a digital 15-min ECG and 30-min heart rate recordings. ECG parameters were measured using the MEANS program. Indices of the heart rate variability (HRV) were obtained using the VariaCardio system. Ankle-brachial-pressure index (ABI), LV mass index (LVMI) and myocardial performance index (Tei-index) were assessed by ultrasonography.**Results:** The spQRS-Ta was higher in the subjects with T2DM in comparison with the controls (24.5±10.7 vs. 9.7±4.5, P<0.001) and in the subjects with CAN than in those without CAN (30.1±11.3 vs. 19.5±7.1, P<0.001). No differences were found in the QT-interval between the studied groups. Multivariate linear regression analysis in the subjects with T2DM demonstrated independent associations between the spQRS-Ta, the presence and the severity of CAN (P<0.001), HbA1c (P<0.001), duration of diabetes (P=0.004), HOMA-IR (P<0.001), diabetic cardiomyopathy (P=0.02) and sympatho-vagal imbalance (P<0.001).**Conclusions:** The spQRS-Ta is increased in patients with T2DM and CAN, suggesting ventricular repolarization heterogeneity. The metabolic and cardiovascular factors associated with the presence of CAN in diabetes (duration and degree of hyperglycaemia, diabetic treatment) were also independently associated with ventricular arrhythmogeneity, assessed by spQRS-Ta. SpQRS-Ta was also independently associated with the structural and functional substrate involved in diabetic cardiomyopathy. QT and its parameters were found to be impaired by CAN. SpQRS-Ta is an effective, noninvasive, low-cost test for the early detection of CAN and prospective studies will further show if its determination can help clinicians better stratify diabetic individuals and prevent CAN's clinical manifestations and symptoms that may cause lethal outcomes.

P368

Atorvastatin worsens glucose metabolism and insulin sensitivity in patients with metabolic syndrome/type 2 diabetesK Koh¹, M Quon²¹Gachon University, Incheon, Republic of Korea, ²NIH, Diabetes Unit, Bethesda, United States of America**Topic: Diabetes****Background:** We compared the effects of atorvastatin on glucose metabolism and insulin sensitivity in hypercholesterolemic patients with and without metabolic syndrome/diabetes.**Methods:** Randomized, single-blind, placebo-controlled, parallel study. Age, sex, and body mass index were matched. Forty-four patients were given on placebo and 42, 44, 43, and 40 patients were given daily on atorvastatin 10, 20, 40, and 80 mg, respectively during a 2 month treatment period. Nineteen patients on placebo and 18, 18, 20, and 18 patients on atorvastatin 10, 20, 40, and 80 mg were metabolic syndrome/diabetes.**Results:** Atorvastatin 10, 20, 40, and 80 mg significantly reduced LDL cholesterol (median % changes; 39, 47, 52, and 54%) and apolipoprotein B levels (31, 37, 44, and 48%) after 2 months therapy when compared with baseline (all P<0.001 by paired t-test) or when compared with placebo (P<0.001 by ANOVA). Atorvastatin 10, 20, 40, and 80 mg significantly increased insulin (27, 63, 36, and 58%) and glycated hemoglobin levels (4, 7, 7, and 8%) from baseline (all P<0.05 by paired t-test) or when compared with placebo (P=0.011 for insulin and P=0.004 for glycated hemoglobin by ANOVA). Atorvastatin 10, 20, 40, and 80 mg decreased plasma adiponectin levels (0, 18, 2, and 11%) and decreased insulin sensitivity (2, 6, 4, and 6%) when compared with baseline (P=0.732, P=0.024, P=0.508, and P=0.128 for adiponectin; P=0.233, P=0.012, P=0.008, and P=0.003 for insulin sensitivity by paired t-test) or when compared with placebo (P=0.147 for adiponectin and P=0.006 for insulin sensitivity by ANOVA). However, the magnitude of these percent changes (glycated hemoglobin, insulin, adiponectin, and QUICKI) were not significantly different among the four different doses of atorvastatin despite dose-dependent changes in apolipoprotein B reduction. These effects were not significantly different between patients with and without metabolic syndrome/diabetes.**Conclusions:** Atorvastatin significantly increased insulin and glycated hemoglobin levels and reduced insulin sensitivity in hypercholesterolemic patients with metabolic syndrome/diabetes independent of dosage and the extent of apolipoprotein B reduction.

P369

Type 2 Diabetes Mellitus: a true coronary artery disease risk equivalent?SNC Barra, J Silva, P Gomes, R Providencia, L Seca, A L Marques
Hospital Center of Coimbra, Coimbra, Portugal**Topic: Diabetes****Purpose:** Several studies have suggested the risk of mortality is equivalent for non-diabetic patients with known coronary artery disease (CAD) or previous myocardial infarction (MI) and for diabetic patients without previous known CAD or MI. This study aims to investigate the prognostic power of diabetes mellitus (DM) and CAD in predicting cardiovascular (CV) risk following a MI.**Methods:** 178 consecutive patients (70.5±11.7 years old, 64% males) with DM or known CAD admitted with a MI. Data collected: admission glycemia, creatinine, haemoglobin [Hb] and C Reactive Protein (PCR); maximum troponin levels (MaxTrop); glomerular filtration rate (GFR) by MDRD formula; maximum Killip Class (mKC); CAD extension; GRACE risk score (GS). Patients were followed for 24 months. Patients were divided in 2 groups (Group A: diabetes without known CAD; Group B: non-diabetics with previous known CAD).**Results:** Patients of Group A had significantly higher: intra-hospital mortality (17.7% vs 6.2%, p=0.03, OR 3.33), GS (173.9 vs 157.2, p=0.027), risk for acute heart failure (50.4% vs 33.9%, p=0.032, OR 1.99); average mKC (1.92 vs 1.60, p<0.001), PCR (4.52 vs 1.37, p=0.004) and, as expected, admission glycaemia (12.62 vs 7.21). Patients in both groups did not differ in admission Hb, MaxTrop (despite a trend for higher MaxTrop in group A; 52.3 vs 40.9, p=0.2), creatinine, GFR and, surprisingly, CAD extension (the number of arteries and segments with significant stenotic lesions was not significantly different in both groups). Cardiovascular risk during follow-up was similar in patients from both groups, as evidenced by a similar mortality rate, risk for recurrent angina, reinfarction, stroke and decompensated heart failure.**Conclusions:** Diabetic patients without previous known CAD had a higher mortality rate and a higher risk for acute heart failure. However, DM was truly a CAD risk equivalent in what concerns myocardial necrosis extension and CAD severity as analyzed by coronariography. Also, CV risk during a 2 year follow-up was not significantly different in both groups, attesting the equivalence between DM and known CAD. This highlights the importance of aggressive therapeutic approach for all diabetic patients with a MI.

P370

Difference of positive remodeling area between DM and non-DM heart disease subjects

Y Miyaishi, H Adachi, J Murakami, H Hoshizaki, S Oshima

Gunma Prefectural Cardiovascular Center, Maebashi, Japan

Topic: Diabetes**Background and Purpose:** Compensatory enlargement of coronary artery is frequently investigated in patients with angiographically normal coronary arteries by intracoronary ultrasound examinations (IVUS). Although diabetes mellitus (DM) is well known to be one of the coronary risk factors, little is known whether it also affects on positive remodeling or not. We investigated the effect of diabetes mellitus on development of positive remodeling.**Method:** We investigated consecutive 112 ischemic heart disease patients who had been performed percutaneous coronary interventions (PCI) to mid-LAD (left anterior descending) lesions using IVUS procedure from May 2008 to June 2009 in our hospital. We measured external elastic membrane (EEM) diameter and minimum lumen diameter at the proximal site of LAD, with no significant stenosis. The positive remodeling ratio was determined as follows; EEM diameter*100/minimum lumen diameter. Patients were assigned into DM or non-DM groups (PG 193.5mg/dl v.s. 124.5mg/dl, respectively).**Results:** There was no significant difference in minimum lumen diameter between DM and non-DM groups (3.29±/-0.70v.s.3.50±/-0.75mm, respectively). However, positive remodeling ratio was significantly (p<0.05) greater in DM group (149±/-26%) than in non-DM group (138±/-24%).**Conclusion:** It is revealed that the positive remodeling is more advanced in diabetic patients although coronary artery seems to be normal angiographically.

P371

Natriuretic peptides in at risk cohorts: considerations for clinical interpretation

CM Conlon¹, C Kelleher¹, I Dawkins², C O Loughlin², M Ledwidge², K Mc Donald²
¹University College Dublin, School of Public Health, Physiotherapy & Population Science, Dublin, Ireland, ²St Vincent's University Hospital, Dublin, Ireland

Topic: Biomarkers**The STOP HF Investigators**

Background: B-type natriuretic peptide (BNP) has been proffered as a screening tool for echocardiography referral and detection of LVSD. However, despite its excellent sensitivity there are concerns surrounding its poor specificity and the significant issue of false positives. The literature has repeatedly established associates of higher BNP, however, there is a dearth of information on the magnitude of impact of these associates and whether these factors confound BNP expression.

Objective: To identify the principal associates of BNP and examine the extent of association within a population with cardiovascular risk-factors taking cardio-active therapies.

Methodology: We explored the baseline data set of the ongoing Screening to Prevent Heart Failure Study, a prospective study of primary care based individuals with cardiovascular risk-factors and no documented ventricular dysfunction. Univariate and multivariate (logistic regression) models determined associates of BNP. Using sub-set analyses, the foremost associates of BNP were established and the extent to which they were associated with BNP was examined.

Results: Complete data was available in 1122 individuals (mean age 65, 47% Male, 66% Hypertension, 49% Hypercholesterolemia, 25% Obesity, 16% Coronary artery disease—49% of whom had myocardial-infarction (MI), 15% Smoking, 11% Diabetes). The most common medications were Statins (63%), Anti-platelet (49%), Beta-blockers (30%), ACE-Inhibitors (28%), AIIA (26%), Thiazides (20%), Calcium-Antagonists (16%) and Anti-diabetics (11%). Median biomarker levels fell within normal ranges. Multivariate associates of BNP were age, female, systolic and diastolic blood-pressure, heart-rate, beta-blockers, arrhythmia (all $p < .001$), calcium-antagonist and MI (all $p < 0.5$).

BNP was examined in the context of age, plotting it against age for each individual. A linear regression line was fitted through Log(BNP) for both gender. Using the age-framework, potential associates of BNP were assessed by plotting the median-BNP by sliding decade of age for those with and without a particular risk-factor (looking for a prominent departure between the lines that persisted with age). In particular, beta-blockers were associated with a 1.7-fold increase in BNP.

Conclusions: In defining cut-offs for BNP screening, at minimum, certain characteristics, comorbidities and therapies must be accounted for. In addition to age-referencing, not accounting for beta-blockers in particular, may in part explain the low specificity associated with BNP screening to date. In research efforts, caution should be taken in using BNP as an end-point in populations on beta-blockers.

P372

Can glucose metabolism markers predict post-prandial glycaemia in non-diabetic acute coronary syndrome patients?

S Monteiro, C Lourenco, R Teixeira, E Jorge, R Batista, P Lazaro, P Monteiro, L Providencia

University Hospitals of Coimbra, Coimbra, Portugal

Topic: Biomarkers

Introduction: Glucose metabolism abnormalities are important prognostic predictors in acute coronary syndrome (ACS) patients. Several recent studies have suggested the importance of several glucose metabolism markers and the performance of an oral glucose tolerance test (OGTT) in all non-diabetic ACS patients. However, a question persists: is there a correlation between these markers and post-prandial glycaemia, as assessed by the OGTT?

Aim: To evaluate, in a population of patients not known to be diabetic, admitted for ACS and submitted to OGTT during hospital stay, if there is a relationship between admission glycaemia (AG), glycaemia variation (GV) and glycaemia normalization (GN) and the post-prandial glycaemia determined in the OGTT.

Population and methods: Retrospective analysis of 259 patients not known to be diabetic, admitted for ACS in a single centre and submitted to OGTT during their hospital stay. GV was defined as the difference between AG and the lowest glycaemia value during hospital stay; GN was defined as the difference between AG and the first fasting glycaemia.

Results: After OGTT performance, only 79 patients (30.5%) had a normal glucose metabolism, while 92 (35.5%) showed impaired fasting glucose or impaired glucose tolerance and 88 (34.0%) where diagnosed as diabetics. Patients with a higher post-prandial glycaemia in the OGTT were older, less frequently in Killip class I on admission, had more often high blood pressure, dyslipidaemia, an abnormal ECG and higher heart rate at admission, a diagnosis of myocardial infarction and lower glomerular filtration rate. The spearman correlation test showed that both AG, GV and GN had a positive correlation with higher post-prandial glycaemia values, with the correlation being best for AG (coefficient 0.468; $p < 0.001$) and worst for GN (coefficient 0.281; $p < 0.001$). Multivariate analysis confirmed that all three markers were independent predictors of the post-prandial glycaemia in the OGTT.

Conclusions: In ACS patients without a previous history of diabetes, there is a good correlation between markers of glucose metabolism impairment and post-prandial values of glycaemia determined by OGTT. This fact, never before described, may improve our knowledge of metabolic abnormalities in ACS patients, thus contributing to their better clinical management.

P373

Usefulness of natriuretic peptides in primary health care, an explorative study in elderly patients

M Olofsson, K Boman

Research Unit, Department of Medicine and Geriatrics, Skelleftea, Sweden

Topic: Biomarkers

Background: High levels of negative predictive value (NPV) has been shown (95-100%) for younger patients.

Aim: Primarily to explore the (NPV), positive predictive value (PPV), sensitivity and specificity of natriuretic peptides. Secondly, to evaluate the impact of gender and age in elderly patients with systolic heart failure (HF).

Methods: This is an explorative study from one primary health care centre where 109 patients with symptoms of HF were referred for an echocardiographic examination followed by a cardiovascular consultation. Blood samples for NtproBNP and BNP were collected and stored frozen. Systolic HF was diagnosed in 48 patients (46% men, 54% women, mean age 79 years) while 61 patients (21% men, 79% women, mean age 76 years) had no HF. We explored cut off values for Nt-proBNP from 100 to 500 ng/L partly based on FDA recommendations. To establish corresponding BNP cut-off values we analyzed the quotient between Nt-proBNP/BNP in patients with both systolic and diastolic HF who had the highest median levels. This resulted in cut-off values for BNP from 10 to 50 pg/ml.

Results: Table 1. Shows results of the highest NPV, sensitivity, PPV and specificity for Nt-proBNP and BNP including all 109 patients. In a linear regression analysis, Nt-proBNP ($\beta = 0.035$; $p < 0.001$) and BNP ($\beta = 0.030$; $p < 0.001$) were associated with age, but not with gender. In a multivariate analysis age ($\beta = 0.036$; $p < 0.001$) and male gender ($\beta = 0.270$; $p = 0.014$) were associated with Nt-proBNP, while age only significantly associated with increasing levels of BNP ($\beta = 0.030$; $p < 0.001$).

Conclusion: Natriuretic peptides in an elderly population showed high NPVs, but not as high as in younger patients with HF in other studies. Age and male gender were associated with higher levels of Nt-proBNP while only age was related to BNP.

Table 1.

	NtproBNP	BNP
Cut-off level	200 ng/l	20 pg/ml
NPV	88%	87%
Sensitivity	96%	96%
Cut-off level	500 ng/l	50pg/ml
PPV	81%	68%
Specificity	87%	71%

P374

Human growth hormone and IGF-1 in risk stratification of patients with acute myocardial infarction

M Pytliak¹, V Vargova¹, M Felsoci², V Mechirova¹, A Mandulakova³

¹Safarik University Medical School, Kosice, Slovak Republic, ²Louis Pasteur University Hospital, Kosice, Slovak Republic, ³Hospital in Vranov, nad Toplou, Vranov nad Toplou, Slovak Republic

Topic: Biomarkers

Background: Recently, an increasing number of new biochemical markers has been reported in cardiovascular risk stratification. Clinical risk management of cardiovascular disease would greatly benefit from event stratifying biomarkers. The aim of this study was to compare the concentrations of growth hormone (GH) and insulin like growth factor-1 (IGF-1) in patients with acute myocardial infarction (AMI) hospitalized in intensive care units compared with the control group. Furthermore, authors assessed a possible correlation between the levels of GH and IGF-1 and markers of myocardial necrosis troponin, and a correlation with left ventricular ejection fraction measured on the seventh day after AMI.

Methods: We examined group of 35 patients in the age of 50-60 years with ST segment elevation myocardial infarction (STEMI), defined as clinical manifestations of ischemia, ECG criteria and positivity of cardiospecific enzymes. The control group consisted of 17 patients who were admitted to the hospital for the differential diagnosis of chest pain. These patients had a normal ECG record, negative cardiospecific enzymes, and (if indicated) a negative ergometric examination during hospitalization. For the determination of GH and IGF-1 concentration, blood was collected in peracute phase of 4.5 hours \pm 30 minutes after the chest pain had appeared followed by the second specimen on the 7th day after AMI. Echocardiography was performed on the 7th day of hospitalization.

Results: When compared patients with AMI with control group, their GH levels were significantly higher in peracute phase (1.42 ± 0.25 vs. 0.48 ± 0.07 ng/ml respectively, $p < 0.001$) and nonsignificantly higher on the 7th day after AMI (0.52 ± 0.09 vs. 0.48 ± 0.07 ng/ml respectively). In the group of patients with AMI, GH levels were about 2 to 3-fold higher in peracute stage than on the 7-th day of AMI (1.42 ± 0.25 vs. 0.52 ± 0.09 ng/ml, $p < 0.01$). GH levels correlated positively with troponin levels in peracute phase ($r = 0.68159$, $p = 0.0051$) and negatively with the values of ejection fraction measured on the 7th day after AMI ($r = -0.733747$, $p = 0.0018$). IGF-1 was positively correlated with left ventricular ejection fraction ($r = 0.78741$, $p = 0.0005$).

Conclusion: Based on our data, we suggest that monitoring of the concentration of GH and IGF-1 in peracute phase of AMI might be of clinical importance in risk stratification, early detection of development of left ventricular dysfunction and eventually treatment monitoring.

P375**Heart Fatty Acid Binding Protein (h-FABP) is an optimal point of care diagnostic test in early phase of non-ST elevation Acute Coronary Syndromes**

M Rus, MI Popescu, AI Ardelean, C Costescu, EE Babes, VV Babes

*University of Medicine and Pharmacy, Oradea, Romania***Topic: Biomarkers**

Introduction: The heart-type specific Fatty Acid Binding Protein (h-FABP) is a small, cytosolic protein (15 kDa) which may be useful for both rapid confirmation and exclusion of acute myocardial infarction.

Objective: To determine the usefulness of a qualitative h-FABP rapid test (CardioDetect-med) in a group of patients with acute coronary syndrome without persistent ST-segment elevation.

Method: In group of 100 (66 males, 34 females; 64 smokers) consecutive patients (mean age 61.66 years; median 62.5 years) with acute coronary syndrome without ST-segment elevation on admission (median onset-to-door interval was 6 hours (range 1 to 24 hours); Ecg exam at admission showed non ST-segment elevation (normal Ecg or ST depression or T wave inversion) and without renal insufficiency and muscle injury.

Qualitative tests for serum h-FABP and quantitative for cardiac troponin I (cut-off value = 0.1 $\mu\text{g/L}$) and CK-MB (cut-off value 24 U/L) were performed on admission and 3 hours later. The ultimate diagnosis of NSTEMI was confirmed in case of a second positive result of cTnI measurement. Each patient underwent diagnostic coronarography to confirm level of coronary artery stenosis.

Results: NSTEMI was finally diagnosed at 56 pts out of total 100 (56%). Diagnostic sensitivity, specificity, positive, negative predictive value and accuracy on admission and after 3 hour for h-FABP, CK-MB and cTnI are shown on the table.

Diagnosis enzyme

Results of cardiac biomarkers	h-FABP "0"	h-FABP "3"	CK-MB "0"	CK-MB "3"	cTnI "0"	cTnI "3"
Sensitivity	94,64%	96,43%	67,86%	85,71%	66,07%	100%
Specificity	97,73%	97,73%	93,18%	95,45%	100%	100%
Positive predictive value	98,15%	98,18%	92,68%	96,0%	69,84%	100%
Negative predictive value	93,48%	95,56%	69,49%	84,0%	100%	100%
Accuracy	86%	97%	79%	90%	81%	100%

h-FABP - heart Fatty Acid Binding Protein, CK-MB - fraction MB of creatine kinase, cTnI - cardiac troponin I.

P376**Does uric acid have a pathogenetic role in left ventricular remodelling and arrhythmogenesis in patients after myocardial infarction ?**

S Lypovetska, MI Shved

*Ternopil State Medical University, Ternopil, Ukraine***Topic: Biomarkers**

Background: The role of serum uric acid (SUA) in the process of atherosclerosis and atherothrombosis is controversial. Epidemiological studies have recently shown that SUA may be risk factor for cardiovascular diseases and negative prognostic marker for mortality in subjects after myocardial infarction.

Aim: To investigate the potential impact of SUA levels on left ventricular structural, functional changes and arrhythmogenesis in patients after myocardial infarction.

Methods: 127 patients (59.2 \pm 0.8 years old) after myocardial infarction were included in cross-sectional study. The subjects were divided in two groups with high and normal SUA level. Echocardiographic assessment, Holter monitoring were performed.

Results: Patients with high SUA (n=86) compared to those with low SUA (n=41) had higher left ventricular mass 6.9 vs 147.4 \pm index (220.9 \pm 0.01) and left atrial dimension (4.0 \pm 0.3, p \leq 0.5 vs 3.5 \pm 0.8, p \leq 0.01), while did not differ in ejection fraction. Concentric and eccentric hypertrophy were observed in 58.1 % and 38.4 % patients with hyperuricemia, 26.8 % and 31.7% - with normouricemia. Diastolic dysfunction was more often investigated in 0.01). SUA levels<patients with high SUA than with normal (94.2 % vs 36.6 %, p correlated significantly with mitral E wave velocity (r=0.61, p<0.01), E wave 0.05). There was no<0.01), E/A ratio (r=0.21, p<0.01), p<0.26, p difference in frequency of atrial fibrillation and supraventricular premature beats in both groups, while high grade ventricular premature beats according to Lown Wolf were observed in 2.5 times more often in patients with high SUA. Also they had increased Q-T dispersion more than 70 ms and decreased heart rate variability (SDNN less than 100 ms). Involvement of His-Purkinje system was more often observed in patients with hyperuricemia (74.4 % vs 26.8 %, p<0.01).

Conclusion: Elevated SUA level is associated with left ventricular hypertrophy and diastolic dysfunction in patients after myocardial infarction, reflecting increased cardiovascular risk. Left ventricular hypertrophy plays important role in arrhythmogenesis and along with hyperuricemia it is a strong risk factor for future cardiac events as well as sudden cardiac death.

P377**Serial measurements of NT-proBNP in with unstable angina pectoris treated by statins**

A Astvatsatryan, M Senan

*European Regional Educational Academy, Faculty of Medicine, Yerevan, Armenia***Topic: Biomarkers**

It is well known that brain natriuretic peptide (BNP) and N-terminal fragment (NT-proBNP) levels in the blood are used for screening, diagnosis of acute congestive heart failure (CHF) and may be useful to establish prognosis in heart failure, as both markers are typically higher in patients with worse outcome. The plasma concentrations of both BNP and NT-proBNP are also typically increased in patients with asymptomatic or symptomatic left ventricular dysfunction. There is no strict level of BNP that perfectly separates patients with and without heart failure. There are limited data on evolution of BNP/NT-proBNP levels in unstable angina pectoris (UA). HMG-CoA reductase inhibitors (statins) substantially improve clinical outcomes in pts with CAD. Therefore, we tried to assess the clinical significance of serial measurements of serum NT-proBNP in UA treated with different types of statins (Pravastatin and Atorvastatin).

Methods: 42 pts (14 female, aged 46 \pm 21) with UA were involved in our study with follow up 20 weeks. In 24 hours after admission pts were randomized on Pravastatin (P) 80 mg/daily (Group P, n=20) or Atorvastatin 40 mg/daily (Group A, n=22). All pts were on standard therapy (heparin, aspirin, beta-blockers, nitrates, 33 were on ACE inhibitors). Total cholesterol (TCL) was measured on admission and on 20 week. On 12 hrs and 24 hrs after admission blood samples were collected for NT-proBNP.

Results: Serum NT-proBNP concentration was higher in Group P 1969 pg/ml [75-44775] than in Group A 12339 pg/ml [776-41667], (p<0.03) after 12 hour and 1037 pg/ml [96-32345] vs. 11930 pg/ml [105-65022], p<0.01 after 24h. Unexpectedly, in the Group A NT-proBNP decreased during first week of the treatment (p<0.001), while in Group P NT-proBNP remained at the same high level. The primary end-point (a composite end-point of death, non-fatal MI, rehospitalization for worsening angina at 20 weeks) was better in Group A: 13.8% vs. 18.54% (p < 0.05) but robust endpoints like death/MI were similar in both groups (11.2% vs. 11.9%; p=NS). The difference in the primary end-point was driven by rehospitalization for recurrent angina (6.3% vs. 8.9%). During all follow up, TCL drops more significantly in Group A. On the end of follow up TCL became normal in 10 pts (49.9%) in Group P and 16 (72.7%) in Group A (p<0.03) without significant hepatic enzyme elevations.

Conclusion: Near normal NT-proBNP values or their rapid decrease within first 24 hrs of the treatment of UA, indicate good prognosis, while persistent elevated NT-proBNP during treatment suggests high-risk pts. A seems to be more preferable than P in pts with UA.

P378**Absorption and filtration apheresis columns lower LDL equally, but have different effects on inflammatory biomarkers**

A Hovland, RI Hardersen, TE Mollnes, KT Lappegaard

*Nordland Hospital, Bodo, Norway***Topic: Biomarkers**

Purpose: Low density lipoprotein (LDL) apheresis is well established in hypercholesterolemia otherwise uncontrolled. This treatment affects biomarkers of importance in atherosclerosis. Hence we systematically compared three different LDL apheresis columns in this regard.

Methods: Three patients with heterozygous familial hypercholesterolemia participated in a cross-over study with six concurrent treatments with three different LDL apheresis columns: DL75 (whole blood adsorption), LA15 (plasma adsorption) and EC50W (plasma filtration). Blood samples were drawn before and after treatment. A range of biochemical parameters and inflammatory biomarkers, including LDL-cholesterol, high-sensitivity C-Reactive Protein (hs-CRP) and numerous cytokines, were compared. Due to inter-individual variation, cytokine concentrations were normalized for evaluation of column effect.

Results: All three columns gave a 66-69% decrease in LDL. The reduction was highly significant (p<0.001) without inter-column differences. hs-CRP dropped 75%, 69% and 46% for columns DL75, LA15 and EC50W, respectively (p<0.001 for all). Normalized changes in cytokines are shown in the table below. Of notice is the considerable increase in IL-1ra and IP-10 with the whole blood column DL75, and the decrease in TNF- α and VEGF with the adsorptive columns DL75 and LA15. Other cytokines, including IL-6, showed less change. The column EC50W induced a 13.3 fold increase in the anaphylatoxin C3a but left C5a-levels unchanged. The other two columns gave a modest increase in C3a and a reduction in C5a.

Conclusions: The LDL-apheresis columns DL75, LA15 and EC50W all lowered LDL-cholesterol significantly and to the same extent. hs-CRP was also significantly reduced. However, several cytokines with importance for coronary atherosclerosis including IL-1ra, IP-10, MCP-1 and TNF- α were differently affected by the columns, as were the anaphylatoxins C3a and C5a. This should be kept in mind in LDL-apheresis, as these patients are at high risk for atherosclerotic events.

Selected cytokines

	IL-1ra	IL-6	IP-10	MCP-1	MIP-1b	TNF α	VEGF
DL75	2.2	1.1	2.6	0.9	0.7	0.4	0.3
LA15	1.8	1.4	2.3	1.8	1.4	0.4	0.3
EC50W	1.4	0.9	1.7	1.5	0.6	0.8	0.4

Normalized mean values of selected biomarkers after LDL apheresis with three different columns. Pretreatment value = 1, n=18, p<0.05.

POSTER SESSION III

Cardiac rehabilitation: psychosocial factors, stress and quality of life

Friday, 7 May 2010, 08:30–12:30 Location: Poster Area

P379

The effects of depression on functional limitations in patients with chronic heart failure

Y Shimizu¹, S Yamada², H Okumura¹, Y Kono¹, F Miyake³, T Izumi⁴

¹Nagoya University Graduate School of Medicine, Program in Physical and Occupational Therapy, Nagoya, Japan, ²Nagoya University, School of Health Sciences, Nagoya, Japan, ³St. Marianna University School of Medicine, Division of Cardiology, Kawasaki, Japan, ⁴Kitasato University School of Medicine, Department of Cardio-angiology, Sagami, Japan

Topic: Cardiovascular rehabilitation

Objective: This study was aimed to examine the effect of depressive symptoms on the course of functional limitations in patients with chronic heart failure (CHF) during recovering phase after hospital discharge.

Methods: Data were obtained from the Preventive effect of exercise for management of daily functioning in patients with CHF (PTMaTCH) study, a prospective cohort study. The Hospital Anxiety and Depression Scale was used to evaluate the depression. Functional limitations were measured by the Performance Measure for Activities of Daily Living-8 (PMADL-8) at 1, 3 and 5 months post-discharge. Relationships of functional limitations to demographic variables, bio-physiological variables, physical function variables, and depressive symptoms were examined with bivariate correlations and stepwise multiple regression analyses. Two-way repeated-measures analysis of variance (ANOVA) was used to assess the effects of depressive symptoms on the course of functional limitations. Using a cluster analysis, we identified classes characterized by distinctive courses of functional limitations and then examined their link to depression.

Results: A total of 254 subjects participated in the PTHaTCH study and the data of 148 subjects who answered all the three points (1, 3, 5 months) were analyzed in this study. More than half reported "somewhat hard" or "very hard" in each items (activities of daily living) of the PMADL-8. Worse functional limitations was associated with a more severe depressive symptoms ($r = .46$, $P < .001$) and lower grip strength ($r = -.40$, $P < .001$). Depressive symptoms and grip strength accounted for 33% of the variance in functional limitations at 5 months post-discharge ($P < .001$). In two-way ANOVA, depressive symptoms significantly had the effect on the course of functional limitations ($F = 30.7$, $P < .001$) but no interaction with time ($F = 1.06$, $P = .35$). By the cluster analysis, 4 distinct courses were found and the class of subjects with stable severe functional limitations had a significantly higher rate of depressive symptoms than all other clusters ($P < .001$).

Conclusion: In our prospective study, depressive symptoms negatively affected the course of functional limitations in patients with CHF. The findings of this study suggest that depression may be a treatment target to improve functional limitations during recovering phase in CHF patients.

P380

Psychosocial variables in adherence to cardiac rehabilitation program

DPGR Guerra Rosas Dinorah, ZL Lugli Zoraida

Simon Bolivar University, Caracas, Venezuela

Topic: Cardiovascular rehabilitation

Objective: To explore the predictive and discriminative ability of psycho-social variables on different patterns of adherence to the cardiac rehabilitation program (CRP). Materials and

Methods: using a cross-sectional and comparative design, we evaluated 112 myocardial infarction (MI) survivor patients, referred for CRP from January 2005 through December 2007. The patients were divided into three groups according to their pattern of adherence to CRP: "begin and finished" (Group I), "begin and not finished" (Group II) and "never begin" (Group III). Measured variables were: Hostility, Coping Strategies, Social Support, Self-efficacy for programmed and daily physical activity. Measurement instruments used were validated for Venezuelan population.

Results: Discriminative analysis revealed that coping directed to the problem, perceived social support and self-efficacy, were statistically significant for discriminating groups according to their pattern of adherence to the CRP; while the variables hostility and emotional coping, were not significant to explain the difference between the groups.

Conclusion: Hostility is a variable associated to cardiovascular disease but not relate to the adherence behavior; rather, different levels of problem-focused coping, perceived social support and self-efficacy, both programmed as daily, predicted belonging to the group. Clinicians staff must to considerate to training this variables to ensure the adherence to CRP.

P381

Overcoming the barriers; increasing completion rates of indigenous cardiac rehabilitation through partnership

S M StewartEadie¹, M Tane²

¹National Heart Foundation of New Zealand, Auckland, New Zealand, ²Te Hoto Manawa Maori, Auckland, New Zealand

Topic: Cardiovascular rehabilitation

Background: Cardiovascular disease in New Zealand's indigenous Maori is associated with significant inequalities, with mortality rates for those under 65 being more than four times that of mainstream for the same age. Furthermore those that do survive a myocardial infarction are less likely to receive the benefit of cardiac rehabilitation, with attendance and completion rates being half that of mainstream, by percentage of the population. To help redress this, the Heart Foundation of New Zealand and the Maori equivalent, Te Hoto Manawa Maori partnered together to develop a new home based cardiac rehabilitation programme for both mainstream and Maori, called Heart Guide Aotearoa.

Method: A quantitative and qualitative study was developed to evaluate whether the new model of cardiac rehabilitation would significantly increase uptake and completion of cardiac rehabilitation. 413 participants were enrolled from seven sites, and the results would be compared to an earlier audit of traditional hospital based cardiac rehabilitation services.

Results: Heart Guide Aotearoa resulted in lowering the barriers previously experienced by Maori with completion rates increasing from 21% to 89%. The mean age of those attending also demonstrated improvement falling from 66 years to 58 years old. These results were further reinforced by the qualitative arm of the study that suggested the programme removed the barriers of travel, cost, and illness that often prevent hospital based patients from seeking or completing cardiac rehabilitation. Furthermore many HGA clients demonstrated that they were more able to take control of their condition. They were less fearful and depressed about their future as demonstrated by Hospital Anxiety and Depression Scores and had made a number of positive lifestyle changes.

Summary: This demonstrated that together mainstream and indigenous stakeholders can come together to develop a new and sustainable model of care that helps overcome many of the barriers previously experienced, especially for indigenous Maori. The success of this programme has resulted in the programme being increasingly rolled out across New Zealand and being offered to both mainstream and Maori alike.

P382

Cardiovascular rehabilitation benefits on anxiety and depression scores in patients after valve replacement

M Rada, DV Velimirovici, DMDS Duda-Seiman, SD Dragan, DG Gaita, MBV Berceanu-Vaduva, MDV Velimirovici, SM Mancas

University of Medicine and Pharmacy Victor Babes Timisoara, Timisoara, Romania

Topic: Cardiovascular rehabilitation

Purpose: Anxiety and depression are frequent in patients with history of surgery and are more acute in those with decreased functional reserve. We assessed the influence of comprehensive rehabilitation programme on the anxiety and depression score in patients after valve replacement, depending on gender.

Methods: 73 patients with valve replacement: 46 (63.01%) men, 27 (36.98%) women, mean age: 58±7 years. We considered 2 groups: group A: 38 patients with exercise training programme; group B: 35 patients control. All patients had a complete clinical and paraclinical assessment at admission. HAD scale was used to assess the anxiety-depression score, both at admission and after 3 months (after phase II of rehabilitation). The HAD scale was used to assess the anxiety-depression score, with the following interpretation: 0-7 no anxiety and/or depression; 8-10: low anxiety and/or depression; 11-14 moderate; 15-21: severe. Patients in group A had a regular exercise training program 3 times/week, 30-40 min/meeting to 70-75% from the achieved heart rate at the effort test.

Results: In group A there was noticed a significant improvement both in anxiety and in depression scores (anxiety incidence was higher). Comprehensive rehabilitation programmes led to an improvement of pathologic anxiety: group A: 6.2±1.1 after phase II vs. 11.1±1.5 at baseline (<0.01); group B: 6.7±1.3 after phase II vs. 11.3±1.6 at baseline (<0.05).

Depression score was improved more obvious in group A: 5.2±0.6 after phase II vs. 12.2±1.4 at baseline (<0.05).

Conclusions: Anxiety is more frequent than depression in patients after valve replacement. Comprehensive cardiac rehabilitation programmes, where exercise training and psychological counseling play a key role, lead to effort capacity increase and improvement of the anxiety-depression score. Men appear to be a protective factor against anxiety.

P383**The CHARMS Study: Cardiac rehabilitation staff views about discussing sexual issues with coronary heart disease patients: a national survey in Ireland**S Doherty¹, M Byrne¹, HM McGeec², AW Murphy¹¹National University of Ireland, Galway, Ireland, ²Royal College of Surgeons in Ireland, Dublin, Ireland**Topic: Cardiovascular rehabilitation****Background:** While a healthy sexual life is regarded as an important aspect of quality of life, sexual counselling from healthcare providers for cardiac patients has received little attention in the literature.**Aim:** To document current practice and assess the needs of cardiac rehabilitation service providers in Ireland with regard to sexual assessment and management for patients.**Methods:** Cardiac rehabilitation staff in all relevant centres in Ireland responded to a postal questionnaire. Sexual health management was assessed by a series of questions on current practice, and staff attitudes, beliefs and perceived barriers to discussing sexual problems.**Results:** Staff (N=60;61% response rate) reported a lack of assessment and counselling protocols for addressing sexual health problems, with little or no onward referral system available. Results also suggest staff believe that patients don't expect them to ask about their sexual concerns. Barriers reported included an overall lack of confidence (45%), knowledge (58%) and training (85%).**Conclusion:** Development of guidelines, assessment protocols and training for cardiac rehabilitation staff are essential in the area of sexual health problems in order to improve the quality of services for patients with coronary heart disease.**P384****MI patients intentions to attend cardiac rehabilitation programmes, a quantitative survey**G McKeec¹, S O Donnell¹, M Mooney¹, F O'Brien¹, D Moser²¹Trinity College, Dublin, Ireland, ²University of Kentucky, Lexington, United States of America**Topic: Cardiovascular rehabilitation**

National guidelines recommend that all eligible patients be invited to partake in rehabilitation programmes. The literature cites the numerous reasons patients give as to why they do not want to attend cardiac rehabilitation programmes. These include: gender, transport problems, comorbidities psychological reasons, poor motivation and work commitments.

Purpose: To ascertain the proportion of patients who intend to attend Phase III cardiac rehabilitation. To describe the reasons why patients do not intend to attend Phase III cardiac rehabilitation programmes**Methods:** This study is part of a larger project based in five major academic teaching hospitals. Patients admitted to hospital with ACS symptoms and who fulfilled the eligibility criteria were invited to take part in the study. Each participant then completed an in-depth questionnaire which contained items related to their current cardiac condition. Two of these items were related to the participants' intention to attend cardiac rehabilitation and these findings are presented here. Data were analysed using SPSS.**Results:** The sample demographics were, age 62.18±11.86 years, 68% male, current diagnosis: 44% STEMI, 56% NSTEMI. A total of 1341 patients participated in the study, 1292 completed the question, 1004 (78%) stated that they intended to go to cardiac rehabilitation and the remaining 288 (22%) stated that they did not. The following are the main reasons stated for non-attendance: not interested 40%, programme would be of no assistance 11%, previously attended 10%, not yet discussed 9%, difficulty with transport 6%, work or time difficulties 6%.**Conclusions:** It was reassuring to note that 78% of patients planned to attend a cardiac rehabilitation programme. The reasons given for not wishing to attend cardiac rehabilitation are clinically very significant. Given the obvious benefits of such a programme for cardiac patients, in relation to education, counselling, exercise, recovery etc it is important that programme co-ordinators are cognisant of everyday issues that may impact on the individuals' intention to attend. Some of the reasons cited such as "uninterested" and the "programme would be of no assistance", leave room for further discussion with a cardiac rehabilitation team member. They could encourage, motivate, reinforce the advantages of cardiac rehabilitation and indicate even more clearly that it is not just about exercise and that all aspects of the programme are individualised and autonomous.**P385****Cardiopulmonary exercise training in patients with ischemic heart disease: systolic function and quality of life**

J Siegelova, J Pochmonova, L Mifkova, L Vymazalova, A Havelkova, L Konecny, P Vank, B Fiser

Masaryk University, Faculty of Medicine, Brno, Czech Republic

Topic: Cardiovascular rehabilitation**Purpose of the study:** The aim of the present paper was to study oxygen transport system, work load and quality of life in two groups of patients with ischemic heart disease (group with ejection fraction EF>40% and group with EF<40%) before and after twelve weeks lasting exercise training.**Methods:** Seventy one patients with ischemic heart disease with ejection fraction EF>40% (EF mean value 53±7%), body mass index BMI 28±2 kg.m⁻², mean age 61±10 years, and 17 patients with EF<40% (EF mean value 33±7%), body mass index BMI 28±5 kg.m⁻², mean age 66±8 years were examined. Symptom-limited spirometry was provided before and after exercise training, which consisted of warmup period, aerobic training, resistance training and cool-down period (twelve weeks 3 times per week). We evaluated capacity of oxygen transport system (VO2SL, ml.min⁻¹, VO2SL.kg⁻¹ ml.min⁻¹.kg⁻¹), maximal reached load symptom-limited (WmaxSL, W, WmaxSL.kg⁻¹ W.kg⁻¹) and, using Seattle Angina Questionnaire (SAQ 1-5), subjective estimation of quality of life.**Results:** In the group with EF>40% we have found (before versus after) significant change of WmaxSL (115.6±34.0 v. 124.4±36.2, p<0.01), WmaxSL.kg⁻¹ (1.4±0.4 v. 1.45±0.43, p<0.01) VO2SL (1739±422 v. 1862±444, p<0.05), VO2SL.kg⁻¹ (20.4±4.9 v. 21.8±5.3, p<0.05), SAQ1 (78.8±18 v. 84±22, p<0.01) SAQ2 (76±22 v. 85±16, p<0.01) SAQ3 (88±15 v. 93±8, p<0.01), SAQ4 (88±15 v. 94±8, p<0.01), SAQ5 (65±16 v. 74±16, p<0.01). In the group with EF<40% we have found WmaxSL (97.2±22.7 v. 112.2±30.9), VO2SL (1510±320 v. 1718±416, p<0.05), VO2SL.kg⁻¹ (17.9±4.0 v. 20.7±6.6, p<0.05). The values of SAQ have not been changed significantly: SAQ1 (83±16 v. 86±14), SAQ2 (85±17 v. 88±14), SAQ3 (87±12 v. 91±10), SAQ4 (87±18 v. 90±15), SAQ5 (71±20 v. 75±21).**Conclusion:** Twelve weeks lasting exercise training increased oxygen transport capacity and work load in both groups of patients with ischemic heart disease. The quality of life after exercise training was improved only in the group with EF 53±7%, in the group with EF 33±7% it was not changed.**P386****Comparison of a questionnaire to assess anxiety and depression among executives and non-executives and the cardiovascular reactivity to mental stress**A Coimbra¹, RRT Castro², A Arantes³, R Cruz³, A Leal³, F Varzim³, M Andrade³, ACL Nobrega⁴¹FAPES/BNDES - Hospital Pró cardíaco, Rio de Janeiro, Brazil, ²Instituto Nacional de Traumatologia e Ortopedia, Rio de Janeiro, Brazil, ³FAPES/BNDES, Rio de Janeiro, Brazil, ⁴Hospital Pró cardíaco, Rio de Janeiro, Brazil**Topic: Occupational health****Purpose:** Working environments have been the subject of research related to stress and there seems to be differences between the level of stress and anxiety among employees at different levels. Our study investigated the relationship between the answers to a validated questionnaire to measure subjective anxiety and depression and the hemodynamic responses to a validated test for measuring cardiovascular reactivity to mental stress among executives and non-executives of a large company.**Methods:** Healthy subjects (n=156) who were not taking any medication were submitted to a questionnaire with 14 questions about anxiety and depression and to the Stroop color test with auditory conflict, where they had to identify the changing color of words on a computer screen while other color names are being pronounced through headphones and a standard arithmetic test. Electrocardiogram was continuously and digitally monitored throughout the tests. Also, non-invasive and intermittent blood pressure with digital esfigmomanometer was registered. Subjects were divided in two groups: normal response to mental stress test (N) and exacerbated response (E). Subjects with an increase of heart rate > 15bpm and/or increase in systolic blood pressure > 25mmHg and/or increase in diastolic blood pressure > 15mmHg were included in the E group.**Results:** the results were compared between executive and non-executives who had normal response to the questionnaire (n = 109) and those who had abnormal response in the questionnaire (n = 47), suggesting anxiety or depression (x² = 0.13). We did not observe correlation between executives and anxiety (x² = 0.28). When compared in relation to the hemodynamic response to mental stress test, we did not find significant correlation between executives or not (x² = 0.28).**Conclusion:** The subjective level of anxiety or depression or the position as executive or non-executive in a large company does not seem to predict the cardiovascular response to simulated mental stress, suggesting that the objective measurement of this response should be performed in order to identify exaggerated responders.

P388**Prevalence, determinants and prognostic significance of type D personality in elderly patients with stable CAD and normal NT-proBNP levels**

J H A J De Sutter, N Van De Veire, J Philippe, M De Buyzere
Ghent University, Ghent, Belgium

Topic: Psychosocial factors and stress

Background and study aims: Type D personality has been proposed as a marker of poor outcome after acute myocardial infarction and in patients with chronic heart failure (CHF). It has also been associated with increased levels of markers of inflammation. Its prevalence, determinants and prognostic significance in elderly patients with stable CAD without CHF has not been studied in detail and is the aim of the present study.

Methods: We prospectively enrolled 176 patients older than 60 years (mean age 71±6 years, 22% women, LVEF 59±13%) with stable CAD (> 6 months after AMI or revascularisation) and NT-proBNP levels < 450 mg/dl. Type D personality was assessed according to the questionnaire developed by Denollet. All patients underwent baseline echocardiography, a maximal spirometry for evaluation of VO2max and a 6 minutes walking distance (6 min WD). The following markers of inflammation were determined: high sensitivity CRP (hsCRP), tumour necrosis factor (TNF) soluble TNF receptor I and II (sTNFrcI and II), and interleukin-6 (IL-6). The Minnesota questionnaire was used as measurement of quality of life (QOL). Patients were followed for a median follow-up of 32 months for the combined endpoint of death, acute myocardial infarction, PCI, CABG and hospitalization for CHF.

Results: In total 38 patients (22%) had type D personality according to the criteria of Denollet. Their QOL was clearly worse (Minnesota QOL 41±22 vs 21±19, p<0.01). Age, gender, diabetes and cardiovascular medication use were comparable between pts with and without type D personality (all p>0.05).

Also LVEF (57±12% vs 60±13%, p=ns), creatinine (0,93±0,17mg/dl vs 0,98±0,18mg/dl, p=ns) and NT-proBNP levels (160±104 pg/ml vs 161±110 pg/ml, p=ns) were comparable. All markers of inflammation were also comparable (p>0.05 for hsCRP, IL-6, TNF and sTNFrcI and II) as well as measurements of exercise capacity (VO2max 16,7±5,3 vs 17,2±5,3 ml/kg/min, p=ns, 6 minWD 450±109 m vs 443±99 m, p=ns).

During follow-up 26pts developed cardiac events. Type D personality was not associated with events in univariate and multivariate Cox proportional regression analysis. Event rates were comparable between patients with and without type D personality (Kaplan-Meier Log Rank Chi-Square 0,47, p=0.49).

Conclusions: In elderly patients with stable CAD and normal NT-proBNP levels, type D personality was present in 22% of patients and was associated with a poor quality of life. It was however not associated with parameters of LV dysfunction, increased inflammation or decreased exercise capacity and it did not predict cardiovascular outcome.

P390**Type D personality in patients with multifocal atherosclerosis: prevalence and influence on quality of life**

A N Sumin, OI Raih, EV Korok, AV Karpovich, JAE Bohan, OL Barbarash
RAMS Scientific-Research Institute for Complex Studying of Cardiovascular Diseases, Kemerovo, Russian Federation

Topic: Psychosocial factors and stress

Purpose: The presence of Type D ("distressed") personality is accompanied by the prognosis deterioration in coronary artery disease (CAD) and peripheral arterial disease (PAD). However type D personality did not study at patients with carotid disease (CS) and multifocal ischemic pathology.

The aim of the study was evaluate the prevalence of type D personality and its influence on quality of life (QOL) in patients with multifocal atherosclerosis.

Methods: The study included 499 patients (age 60,7±7,3 years) who were admitted to the hospital for carotid endarterectomy, peripheral arterial reconstruction or coronary artery bypass. All patients were subjected to color duplex examination of the carotid vessels and to lower extremity Doppler study. Coronary angiography was performed on patients with PAD and CS. The patients were divided into 4 groups: group CAD (n=220), group CAD+CS (n=122), group CAD+PAD (n=78), and group CAD+CS+PAD (n=79). Type D personality was measured with the 14-item Type D Personality Scale (DS14). The Short-Form Health Survey 36 (SF-36) was used to assess QOL. The depression scale was used to evaluate depressive symptoms.

Results: (see table). Subscales rates of Type D were higher in the patients with multifocal ischemic pathology. Type D personality was the least often met among CAD group and the most often among patients with coexistence CAD, CS and PAD. Also QOL and depression level were lower in multifocal atherosclerosis in comparison with the isolated CAD.

Conclusion: High prevalence of Type D personality in patients with multifocal ischemic pathology was associated with the deterioration QOL and high level of depression.

Type D in multifocal atherosclerosis

Variables	CAD (n=220)	CAD+CS (n=122)	CAD+PAD (n=78)	CAD+CS+PAD (n=79)	p
Type D (n,%)	24 (10.9%)	28 (22.9%)	28 (35.9%)	30 (37.9%)	0.0001
NA	7.4±0.2	9.2±0.5	10.6±0.9	10.2±0.6	0.0001
SI	7.8±0.2	9.5±0.5	10.7±0.9	10.2±0.5	0.0001
GH	72.7±1.4	53.8±2.4	36.7±3.5	32.5±2.3	0.0001
PF	75.2±1.3	58.3±2.4	38.6±3.4	36.1±2.8	0.0001
SF	58.5±1.4	49.6±1.8	39.0±3.3	43.3±2.6	0.0001
Depression	46.9 ± 0.5	55.2 ± 0.7	57.6 ± 1.6	62.7 ± 0.8	0.0001

NA - Negative Affectivity, SI - Social Inhibition (subscales of DS-14), GH - General health, PF - Physical functioning, SF - Social functioning (subscales of SF-36)

P391**Cardiovascular safety of 1-year escitalopram therapy in clinically nondepressed patients with acute coronary syndrome: results from the DECARD trial**

J A Hanash, B H Hansen, J F Hansen, O W Nielsen, A Rasmussen, M Birket-Smith
Bispebjerg Hospital of the Copenhagen, University Hospital, Copenhagen, Denmark

Topic: Psychosocial factors and stress**DECARD study group**

Background: Selective serotonin reuptake inhibitors (SSRIs) are commonly used for treatment of depression in patients with cardiac diseases. However, evidence of cardiovascular (CV) safety from randomized trials is based on studies of no longer than 6-month duration. We examined the effect of 1-year SSRI escitalopram therapy on multiple CV safety domains in nondepressed patients with recent acute coronary syndrome (ACS).

Methods: The DECARD (DEpression in patients with Coronary ARtery Disease) trial assessed the prophylactic effect of escitalopram on depression after ACS. 240 patients were randomised to either escitalopram 10 mg or matching placebo for one year. Serial measures of CV safety including clinical and biochemical parameters, 24-h ECG monitor, resting ECG and echocardiographic assessment were obtained.

Results: Escitalopram and placebo-groups were comparable at baseline with regard to age, gender, sociodemography, depression score, risk factor profile, severity of heart disease and medications. Dropout rates defined as withdrawal for any reason or lost to follow-up during the 12-month study period was 27.2% in the escitalopram group and 23.4% in the placebo group (NS). There were no statistically significant differences between intervention groups in any of CV safety measures including the incidence of ventricular arrhythmia and episodes of ST-segment depression, length of QTc, and systolic and diastolic echocardiographic measures at the 12-month follow-up between groups. After 12 months, 16 and 13 major adverse events (death, recurrent ACS or acute revascularisation) were recorded in the escitalopram and placebo group, respectively (NS).

Conclusion: One-year escitalopram treatment was safe and well-tolerated in patients with recent ACS.

P392**2 year follow up of patients diagnosed with Non Cardiac Chest Pain (NCCP) attending the Rapid Access Chest Pain Clinic (RACPC) in a single tertiary centre**

S Kasim, J Groarke, B Walsh, J Crowley
University Hospital Galway, Galway, Ireland

Topic: Psychosocial factors and stress

Background: RACPC have been introduced to expedite investigations of patients suspected of having cardiac chest pain by their general practitioners. Many continue to report symptoms despite normal investigations.

Objective: We aim to report on the outcome at two years on patients diagnosed with NCCP and the impact to their lifestyle and the healthcare system.

Methods: Patients referred to the RACPC between January 2004 and April 2006 in University College Hospital Galway was enrolled. Demographics and risk factor profile were obtained from clinical records during attendance to the service. Patients who proceeded to diagnostic coronary angiography after assessment and subsequently diagnosed with non cardiac chest pain were followed up. Follow up was performed via telephone questionnaire that has been validated in previous studies.

Results: 167 patients (female=102, 61%) were identified with normal angiograms after assessment in RACPC. Mean age was 57years old. Risk factors were smokers (25%), hypertension (40%), diabetes (5%) and hypercholesterolemia (34%). At 2 years, 97 patients (58%) continue to report similar symptoms to initial presentation. 48% had symptoms lasting for more than a year. 6.9% report limiting symptoms despite a normal angiogram and up to 23% believed that their symptoms are due to cardiac. No specific diagnosis was made in 34% of 167 patients. Half of these continued to have symptoms on a daily basis. Up to 30% of patients attended their GP more than once. 12patients in the non specific diagnosis group attended the Emergency Department more than once with their symptoms resulting in 6 in patient bed days despite normal angiogram.

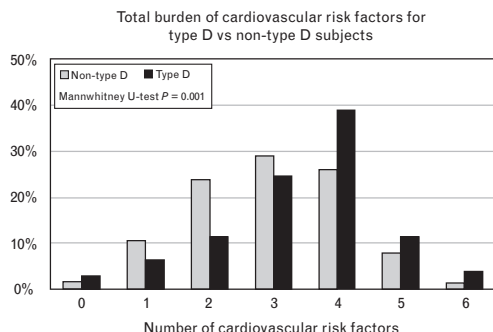
Conclusions: A diagnosis of NCCP failed to alleviate symptoms in a significant number of patients attending the RACPC. These patients should be identified and a pathway constructed to reduce the amount of inappropriate resource utilisation to the healthcare system.

P393

Type D personality and prevalence of cardiovascular risk factors in subjects without established cardiovascular diseaseG Einvik¹, H Hrubos-Strom², A Randby³, SK Namtvedt³, HK Kristiansen³, T Dammen², T Omland³¹Akershus University Hospital, Department of Medicine, Lorenskog, Norway, ²University of Oslo, Department of Behavioural Sciences, Oslo, Norway, ³University of Oslo, Faculty Division, Akershus University Hospital, Oslo, Norway**Topic: Psychosocial factors and stress****Purpose:** Type D personality has been associated with poor cardiovascular outcome in patients with coronary heart disease. However, there is few data on the role for type D personality in primary development of cardiovascular disease. We investigated whether type D personality was associated with the prevalence of cardiovascular risk factors in subjects without overt cardiovascular disease.**Methods:** From an epidemiological survey on symptoms of sleep apnea (Akershus Sleep Apnea Project) 1350 persons were invited to a clinical study, out of whom 535 (39%) were included, 437 without established cardiovascular disease. Type D personality was assessed with DS14. A cardiovascular risk score was calculated by adding the presence or absence of the following risk factors: Hypertension (>140/90 or treatment), diabetes (glucose >7mmol/l or treatment), obesity (BMI25 or waist >102cm men, >88cm women), hyperlipidemia (total cholesterol >5mmol/l or LDL-cholesterol >3mmol/l), current smoking and low physical activity (regular exercise <3h/week).**Results:** Persons with type D personality had a significantly higher cardiovascular risk score (figure 1), due to higher prevalence of smoking and low physical activity (table 1).**Conclusion:** Type D personality may be associated with clustering of cardiovascular risk factors in subjects without established cardiovascular disease.

Table 1. Prevalence (%) of cardiovascular risk factors

	Hypertension	Diabetes	Obesity	Hyperlipidemia	Smoking	Low physical activity
Non-type D	49	30	75	83	21	40
Type D	49	25	82	86	43	57



P394

Mind your mind: lack of introspective insight predicts lower heart rate variability in post-myocardial infarction patientsI Nyklicek¹, EJ Martens¹, BM Szabo¹, J Denollet²¹Tilburg University, CoRePS Center of Research on Psychology in Somatic Diseases, Tilburg, Netherlands, ²St. Elisabeth Hospital Tilburg, Department of Cardiology, Tilburg, Netherlands**Topic: Psychosocial factors and stress****Purpose:** Introspective insight is insight into one's internal psychological states and processes as a result of being able to reflect upon these phenomena. It is hypothesized to lead to more adaptive behavior in general, including health-promoting behavior, resulting in a better hemodynamic function. We examined the association between introspective insight and heart rate variability (HRV; an important marker of cardiovascular function and prognostic factor) in post-myocardial infarction (MI) patients.**Methods:** This study included 82 post-MI patients (82% men, mean age = 56 ± 10 years). All patients completed the Lack of Psychological Mindedness scale (Denollet & Nyklicek, 2004) scale, measuring lack of insight, and had a Holter ECG recorder for 24 hours. Both time and frequency domain measures of HRV were obtained.**Results:** Patients with a lack of introspective insight showed a tendency for lower HRV across both time and frequency domain measures. After adjustment for sex, age, medication, and disease severity (multi-vessel disease and anterior infarction), significance was retained for vagally mediated time domain measures (rMSSD and pNN50) and for low frequency spectral power ($F > 4.22$, $p < .05$). Nonsignificant trends in the same direction were obtained for the vagally mediated high frequency spectral power, the very low frequency power, as well as the overall time domain measures SDNN and SDANN ($F > 3.29$, $p < .08$).**Conclusions:** Lack of introspective insight was associated with lower heart rate variability in post-MI patients. Future studies should examine whether a lack of introspective insight is also associated with an increased risk of adverse clinical events in post-MI patients.

	Low Insight	High Insight	p
VLF	±25.7 (1.5)	29.5 (1.6)	.054
LF	±14.5 (1.5) ÷	±17.9 (1.5) ÷	.039
HF	10.3 (0.9)	±12.2 (0.8) ÷	.074
rMSSD	±25.4 (1.9) ÷	±31.4 (1.9) ÷	.013
pNN50	±6.5 (1.3) ÷	±9.7 (1.2) ÷	.043
SDANN	±96 (5.7) ÷	±109 (6.1) ÷	.077
SDNN	±111 (6.1) ÷	±127 (6.5) ÷	.052

Means (SD) of HRV indices by level of introspective insight

P395

Prevalence of depressive symptoms and low social support level in Polish obese persons. Results of WOBASZ StudyJ Piwonski¹, E Sygnowska¹, A Piwonska¹, W Drygas², T Zdrojewski³, J Gluszek⁴, A Pajak⁵, K Kozakiewicz⁶¹National Institute of Cardiology, Warsaw, Poland, ²Medical University, Lodz, Poland, ³Medical University, Gdansk, Poland, ⁴Poznan University of Medical Sciences, Poznan, Poland, ⁵Jagiellonian University, Cracow, Poland, ⁶Medical University of Silesia, Katowice, Poland**Topic: Psychosocial factors and stress****WOBASZ group****Purpose:** Negative psychosocial risk factors can be both risk factors of obesity due to their effect on person's behaviour as well as they can be a result of being obese because of the lack of acceptance obese persons by family or population. We want to evaluate the prevalence of depressive symptoms and low social support level in obese persons in comparison to the rest of population.**Methods:** Data came from the representative sample of Polish population - 6392 men and 7153 women, aged 20-74, examined in 2003-2005 in the frame of National Multicenter Health Survey (WOBASZ). Study procedure covered questionnaire (socio-demographic data, habits, medical history, psychological questionnaires), physical examination and laboratory tests. Depressive symptoms were assessed using Beck's depressive scale and social support using Berkman and Syme questionnaire.**Results:** 1313 men - M (21%) and 1612 women - W (22%) were obese. Obese persons were older and independently of age had higher levels of risk factors. Both men and women with obesity in comparison to persons without obesity significantly more often had depressive symptoms (M 29% vs 22%, $p < 0.0001$; W 46% vs 30%, $p < 0.0001$). Lack of low social support were observed in 58% of obese M and in 79% obese W (In comparison respectively to 64% M and 68% W without obesity). There was observed the significant association between obesity and depressive symptoms and low social support level, both in men and women. In obese, compared to not obese men, the chance of getting depressive symptoms (independently of age) was higher by 14% (OR=1.14, $p < 0.05$), and in women even by 40% (OR=1.40, $p < 0.0001$). In obese men the chance of getting low social support level was lower by 29% (OR=0.71, $p = 0.0014$), but in women increased by 19% (OR=1.19, $p < 0.05$) compared to not obese persons.**Conclusions:** In obese persons, both men and women, depressive symptoms were observed more often than in persons without obesity, but low social support were observed more often only in obese women.

P396

Lifestyle intervention, quality of life and cost-effectiveness, a randomized controlled trialMK Eriksson¹, EB Malmgren-Olsson², LA Hagberg³, M Eliasson⁴¹Björknäs Health Care Center, Boden, Department of Community Medicine and Rehabilitation, Umea, Sweden, ²Department of Community medicine and rehabilitation, Umea, Sweden, ³Centre for Health Care Sciences, Orebro County Council, Orebro, Sweden, ⁴Department of Medicine, Sunderby Hospital, Lulea, Department of Public Health and Clinical Medicine, Lulea, Sweden**Topic: Quality of life****Background and Purpose:** Individuals with obesity, diabetes and other cardiovascular risk factors report diminished well-being and quality of life (QOL). Lifestyle interventions reduce cardiovascular risk and delay onset of diabetes, but reports on QOL are rare. For complete evaluation of an intervention program it is essential to incorporate the patient's perspective of physical, mental and social well-being. Also cost-effectiveness analysis relies heavily on valid QOL measurements. The effect of a lifestyle intervention in an ordinary primary care setting on health-related quality of life (QOL) and cost-effectiveness was assessed.**Methods:** A total of 151 middle-aged men and women at moderate to high risk for cardiovascular disease were randomly assigned to either a lifestyle intervention or standard care. The 3-month intervention period was administered in the primary care setting and consisted of supervised exercise sessions and diet counseling, followed by regular group meetings during 3-yr. Participants were followed-up at 3, 12, 24 and 36 months. Outcomes were change in QOL measured with the use of EuroQol and 36-Item Short Form Health Survey (SF-36), and SF-6D, and change in motivational stage for physical activity. In a cost-utility analysis the costs, gained quality-adjusted life years (QALY) and savings in health care were considered. Probability of cost-effectiveness was also described using Net Monetary Benefit Method.**Results:** Lifestyle intervention significantly increased EQ Rating scale ($p < 0.01$), and SF-36 physical functioning, bodily pain (less pain), physical component summary ($p < 0.05$) and SF-6D ($p < 0.01$) over the 3-yr period and at time point 3-yr. Standardized response mean (SRM) showed a moderate effect. No significant improvement was seen in EQ-5D or in SF-36 mental dimensions after 3-yr but SRM indicated small effects. More participants in the intervention group progressed to active stages of change for physical activity during the 3-year follow-up ($p < 0.001$). There was a net saving of 47 USD per participant. Cost per gained QALY, savings not counted, were 1668-4813 USD. Probabilities of cost-effectiveness were 89-100% when 50 000 USD was used as threshold of willingness to pay for a gained QALY.**Conclusion:** A lifestyle intervention in primary care improves several dimensions of QOL and motivation for physical activity, up to 3 years. The intervention method was highly cost-effective in relation to standard care.

P397

Tai chi added to endurance training vs endurance training alone in elderly patients with chronic heart failure: a randomized pilot study

G Caminiti, M Volterrani, A Arisi, A Cerrito, R Massaro, S Bovone, A Carluccio, G Rosano

IRCCS San Raffaele Pisana Hospital, Rome, Italy

Topic: Quality of life

Purpose: To assess if Tai Chi added to endurance training (ET) is more effective than ET alone in improving exercise tolerance and quality of life of elderly male patients with chronic heart failure (CHF).

Methods: Twenty-seven male CHF patients, age 73 ± 6 years; ejection fraction 33 ± 9 , NYHA II-III were enrolled. Eleven pts were randomized to combined training (CT) group performing Tai Chi + ET and 10 patients to ET group (ET only). At baseline and after 12 weeks all patients underwent 6-minute walking test (6MWT), assessment of quadriceps maximal voluntary contraction (MVC) and peaktorque (PT) blood pressure and heart rate (HR). Tai Chi and ET were both performed 3 times/week

Results: Exercise was well tolerated. No patients had adverse events. Distance at 6mwt improved in both groups (CT group: 1280 ± 32 m; ET group: 96 ± 23 m) with significant intergroups differences ($p = 0.041$). Rest HR significantly decreased in the CT group while remained unchanged in the ET group (-9 bpm vs 3 bpm, $p = 0.03$). Patients of the CT group had a greater significant improvement in social and emotional QOL than ET group (between groups differences: $+8\%$, $p = 0.01$; $+6\%$, $p = 0.03$ respectively). Patients of CT group had a no significant higher increase of both MVC and PT than ET group.

Conclusions: Tai Chi added to ET, significantly improves exercise tolerance and QOL of patients with CHF.

POSTER SESSION III

Sports cardiology

Friday, 7 May 2010, 08:30–12:30 Location: Poster Area

P398

Blood pressure response to exercise in young athletes associated with classification of sports

N M Nicole MPanhuyzen-Goedkoop¹, R Terink², JLRM Smeets¹
¹Radboud University Nijmegen Medical Centre, Heartlung Centre, Nijmegen, Netherlands,
²Sports Medical Center Papendal, Arnhem, Netherlands

Topic: Sports cardiology

Purpose: hemodynamic responses to maximal exercise testing cover the general population. Bloodpressure (BP) responses in athletes are reported at rest and during ambulatory BP monitoring. BP responses associated with different classes of sports are lacking.

Purpose: To determine BP responses to exercise related to different classes of sports in young athletes (~35yr).

Methods: Young athletes who had pre-participation cardiovascular screening, maximal exercise-ECG, and were engaged in regular physical training and competition > previous 6 month were included in this retrospective study during 2000-2008. Bicycle exercise protocol until exertion, 75 watt (men) or 50 watt (women) during 4min, increment 25 watt / 2 min. BP and ECG at rest, each increment, and recovery phase was measured manually.

Results: 475 athletes were included, 308 men and 167 women, age 9-35yr (mean 24yr). Number of training hours 1-30/wk. Mean resting BP was 122 mmHg systolic and 73.5 mmHg diastolic. Mean resting heart rate was 61.7 bpm on ECG. Mean BP responses to maximal exertion in different classes of sports (mmHg) are in table.

Conclusion: this is the first study that demonstrates different BP responses associated with different classes of sports. The highest systolic and diastolic BP responses were recorded in moderate static-low dynamic sports. The lowest diastolic BP responses were recorded in moderate static-high dynamic sports. Values above the criteria for hypertension on exertion were in moderate static-low dynamic and high static-low dynamic classes of sports. Further studies are warranted to define "normal" blood pressure response to exercise in different classes of sports

Mean BP responses to maximal exertion in

	low dynamic	moderate dynamic	high dynamic
low static	class IA n=3BP data not valid	class IBn=38BP 150/90	class ICn=166BP 200/85
moderate static	class IIA n=23BP 250/100	class IIB n=12BP data not valid	class IICn=49BP 195/70
high static	class IIIA n=19BP 250/95	class IIIB n=22BP 145/60	class IIIC n=143BP 200/85

BP = blood pressure in mmHg.

P399

Undetected arterial hypertension - a serious and important risk factor in teenage athletes: results from a region wide preparticipation study in athletes

A Kassim¹, KA Treusch¹, A Freund², C Beller¹, M Vlachojannis¹, K Erdsiek¹, F Van Buuren¹, KP Mellwig¹

¹Department of Cardiology, Heart and Diabetes Center, North Rhine-Westphalia, Ruhr University Bochum, Bad Oeynhausen, Germany, ²Department of Physiotherapy, Heart and Diabetes Center North Rhine-Westphalia, Ruhr University Bochum, Bad Oeynhausen, Germany

Topic: Sports cardiology

Purpose: Preparticipation screening is recommended by the European Society of Cardiology (ESC) and were published two years ago. The intention was to reduce sudden cardiac deaths in athletes and to evaluate athletes for severe heart conditions for their own protection. The objective of this study was to evaluate the beneficial effects from an additional blood pressure measurements as it is not specifically mentioned (German society of sports medicine does not recommend blood pressure measurement for preparticipation screening) and to focus on blood pressure as an important risk factor in sports activities. As younger athletes come more into focus, the incidence of high bloodpressure in athletes is unknown.

Methods: According to the ESC and EAPCR guidelines, preparticipation screening (history, auscultation, ECG and blood pressure measurements) was done in a network setting with 37 physicians with a sports medicine diploma who do regular preparticipation screening. If elevated blood pressure values (>140/90 mmHg) were present, a second measurement after another 20 minutes of rest was recommended. All athlete files were collected at our center and evaluated. Starting April 2007 until December 2008, 1024 consecutive athlete-files were evaluated.

Results: We received 1024 screened athlete files. Athletes had to be active at least 4 hours per week. Age range was 8 to 68 years of age with a mean age of 37.3 years. 727 athletes were male, 297 were female. Mean systolic blood pressure was 135.48 mmHg (range 81-210), mean diastolic blood pressure was 79.98 mmHg (range 45-118). The results were analysed in decades of age. 145 athletes were 10 to 20 yrs old, 75 athletes were 20 to 30 yrs old. 16.7 % of the female athletes in the age group 10-20 and 7.9 % in the age group 20 to 30 years had elevated blood pressure (systolic, diastolic or both). In male athletes 26.6% under the age of 20 (10-20) and 59.3 % in the age group 20 to 30 had elevated blood pressure. 60 of the 220 athletes under the age of 30 yrs had elevated blood pressure.

Conclusion: Our results show elevated blood pressure values in every fourth young athlete under the age of 30 with a peak incidence (six out of ten) in male athletes age 20 to 30 yrs. Our small collective of 1000 evaluated athletes suggest a higher rate of elevated blood pressure higher screening numbers. Preparticipation screening with blood pressure screening seems to be helpful and very important and hypertension screening and control should be evaluated in further studies.

POSTER SESSION III

Exercise physiology

Friday, 7 May 2010, 08:30–12:30 Location: Poster Area

P400

Patients with recurrent AF episodes treated with beta-blockers: evaluation of exercise tolerance and quality of life. Prospective, 1-year evaluation
E Smolis-Bak, R Dabrowski, B Kazimierska, I Kowalik, H Szwed
National Institute of Cardiology, Warsaw, Poland

Topic: Exercise physiology, testing and training

Atrial fibrillation (AF) significantly influences everyday performance of patients, their exercise capacity, quality of life (qol) and psychic condition. The aim of the study was comprehensive evaluation of 1-year beta-blocker therapy in patients with different forms of AF.

Material and methods: The study group consist of 93 patients, age 40-83 years. There were 42 pts with paroxysmal AF (PAF)-age 66 ± 8.5 , 30 pts with persistent, (PeAF)-age 65.1 ± 10.1 and 20 pts with chronic (CHAF)- 64.0 ± 7.0 . All the patients were treated with beta-blockers (propranolol, metoprolol, bisoprolol). During first (V 0) and after 1-year (V 1) visits, pts performed 6 minutes walking test (6-MWT), qol was estimated according to Nottingham Health Profile questionnaire (NHP) and risk of depression occurrence was estimated by Beck Depression Inventory scale (BDI).

Results: In 6-MWT resting and maximum heart rate was significantly lower in pts with PAF than in the pts with CHAF. Walking distance was significantly longer in all studied groups after 1-year therapy. Pts with CHAF had the longest distance in 6-MWT, but patients with PAF had the greatest improvement in walking distance. Mild symptoms of depression were diagnosed in pts with PAF, but not with CHAF and were not changed after 1-year in spite of beta-blocker therapy. Studied quality of life parameters were not changed in either group after 1-year follow-up. Generally AF significantly limited (V0 vs V1) professional activity (33% vs 22%), home activities (30% vs 39%) and sexual activity (30% vs 34%), least of all social life (15% vs 9%) and family life (15% vs 9%).

Conclusions: 1-year beta-blocker therapy significantly improves exercise tolerance, but not qol parameters. The depression symptoms were more prevalent in patients with paroxysmal AF, but in all patients with different forms of AF were not changed during 1-year follow-up in spite of using older (propranolol) and modern (bisoprolol) beta-blocking drugs.

6 MWT parameters and BDI in AF groups

	PAF	PeAF	CHAF			
V ₀	V ₁	V ₀	V ₁	V ₀	V ₁	
HR rest	68 ± 8	67 ± 7	70 ± 8	70 ± 9	72 ± 10**	78 ± 13**
HR max	84 ± 12	85 ± 10	85 ± 12	88 ± 12	90 ± 14**	97 ± 18**
Distance	505 ± 98	552 ± 105*	518 ± 123	550 ± 127*	614 ± 115**	639 ± 132*
Beck	11.1 ± 5.72	10.5 ± 5.7	9.7 ± 5.8	10.7 ± 6.8	8.7 ± 7.5	7.3 ± 6.7

*p<0.05 vs baseline; **p<0.05 CHAF vs PAF in the same time

P401

Assessment of functional capacity and stratification patients with isolated left ventricular diastolic dysfunction

MN Dekleva¹, J Suzic Ladic¹, S Mazic²

¹Clinical Hospital Center Dr D Misovic, University Clinic for Internal Medicine, Belgrade, Serbia, ²Institute of Physiology, Faculty of Medicine, University of Belgrade, Belgrade, Serbia

Topic: Exercise physiology, testing and training

Cardiopulmonary Exercise Testing (CPET) is a recommended technique for evaluation of putative mechanism that underlies exercise intolerance in HF. Left ventricle (LV) filling abnormalities presented by Doppler echocardiography with similar patterns can be actually the result of different forms of heart disease.

The aim of the study was to assess value of CPET profiles in stratifying patients with different etiology but similar degree of LVDD.

Methods: LV and left atrium (LA) diameters was measured by M mode echocardiography, LA and LV volumes normalized by body surface area (EDV/bsa, ESV/bsa), ejection fraction (LVEF) by biplane Simpson's rule. Mitral inflow velocities (E and A), E/A, dec t E and mitral regurgitation (MR) were assessed by pulse wave Doppler, velocity propagation (Vp) by Color M mode and annular e wave by tissue Doppler imaging.

All patients underwent incremental bicycle exercise whereas respiratory exchange ratio >1 was taken to indicate maximal effort. Peak oxygen uptake (pVO₂), oxygen pulse (VO₂/HR) ventilatory anaerobic threshold (VAT) and ventilatory gas equivalents (VE/VO₂, VE/VO₂) were obtained.

Study patients consisted from 50 patients aged 50.76 ± 8.9 with history of hypertension >2 years and 31 patients aged 49.84 ± 6.9 with history of previous myocardial infarction >1 year. All patients had mild LVDD i.e. impaired relaxation (E/A <1, DTE >220ms) and preserved systolic function (EF >50%).

Results: Demographic, Doppler Echocardiographic and Cardiopulmonary characteristics at rest were similar among two groups. However, significantly higher values of reached pVO₂ (1715 vs. 2083 ml, p <0.001), VO₂/HR (12 vs. 14.6, p <0.001), and percentage of pVO₂ at VAT (55 vs. 64, p = 0.007) were found in patients after AMI compared with hypertensive group. There were significant correlations in both groups between pVO₂ and LV dimensions (LVDD, LVSD) (r = 0.433, r = 0.513, respectively, p <0.001), between pVO₂ and V max A and E/cm (r = -0.413, r = 0.398, respectively, p <0.001).

Conclusion: CPET is a promising method for identifying patients with impaired physical performance in early stage of LVDD. CPET profiles can be various, respective to etiology of the heart disease. Functional capacity in patients with hypertension and coronary disease are closely related to proper LV expansion during cardiac cycle and degree of impaired LV relaxation.

P402

Development of a regression equation to determine the best six minute walk distance (6MWD) in a cardiac rehabilitation (CR) population

J M JenniePatrick¹, H Mcburney²

¹Caulfield Hospital, Melbourne, Australia, ²LaTrobe University, Bendigo, Australia

Topic: Exercise physiology, testing and training

Purpose: Previous studies of the six minute walk test (6MWT) have indicated that at least two walks are needed to ensure reproducibility of the 6MWD in the CR population. This study assessed whether the second 6MWD can be predicted from one 6MWT result.

Method: The 6MWD s from three groups of CR subjects were used. Each 6MWT was performed over a 25 metre indoor track, with a minimum of 20 minutes rest between walks. Group 1 and 2 had performed their tests on admission to CR and Group 3 on discharge.

Group 1 (initial sample, n=119, 99 male, 20 female, mean age 62.32 ± 12.58 years)

Group 2 (validation sample, n=156, 119 male, 37 female, mean age 63.0 ± 13.6 years)

Group 3 (discharge sample, n=85, 57 male, 18 female, mean age 59.92 ± 12.67 years)

Results: For each group there was a high correlation between first and second 6MWD (Group 1 R = .977, Group 2 R = .948, Group 3 R = .963) but also a statistically significant difference between the mean 6MWD of each walk (p<0.001 for all groups).

Using the data from Group 1, multiple regression was used to generate an equation that could predict second 6MWD from the variables of: first 6MWD, age, gender, height, weight, body mass index. A statistically significant equation was generated that used only first 6MWD, age and a constant. $6MWD2 = (0.986 \times 6MWD1) - (0.438 \times \text{age in years}) + 49.34$. Each predictor was significant within the equation. Using the equation, a predicted 6MWD2 was generated for each of the three groups and compared to the actual 6MWD2 achieved by each subject.

Correlations between the actual and predicted 6MWD2 for each group were:

Group 1 R = .978

Group 2 R = .948

Group 3 R = .963

The mean differences between the actual and predicted 6MWD2 for each group were compared using paired t tests (see Table 1).

Conclusions: This suggests that for all three groups the mean distances predicted by the equation for the second walk were close to the actual mean distances walked by the subjects. Therefore the equation $6MWD2 = (0.986 \times 6MWD1) - (0.438 \times \text{age in years}) + 49.34$ can be used to reliably predict the second 6MWD from one 6MWT, in the CR population.

Table 1

Group	Mean difference (metres)	95% confidence interval for difference	t	p
1	0.75	-4.29 to 4.44	0.034	0.973
2	0.245	-5.94 to 5.44	-0.87	0.93
3	-2.321	-8.97 to 4.35	-0.69	0.49

Mean differences between actual and predicted 6MWD2 for each group.

P403

Troponin T elevation after endurance exercise is related to running experience independent of run time and total number of heart beats

P Aagaard, M Stahlberg, A Sahlen, F Braunschweig

Karolinska Institutet, Department of Cardiology, Karolinska University Hospital, Stockholm, Sweden

Topic: Exercise physiology, testing and training

Background/Objective: Elevation of cardiac troponin is seen after strenuous physical exertion. Previous reports indicate that this occurs predominantly in inexperienced athletes. A potential cause for this phenomenon is that inexperienced runners have longer race durations which may involve a larger total number of heart beats during the race. This study investigated the association between post-exertional troponin levels, race experience and the number of heart beats during a long-distance race.

Methods: 34 male participants in a 30 km cross-country race were recruited based on prior endurance running experience and matched by age: 16 novices (no previous events; 46 ± 7 ys) and 18 experienced runners (defined as ≥ 10 previous events; 15 ± 6 events; 48 ± 6 ys). We recorded their body mass index (BMI) and analysed their pre- and post-race troponin T levels. During the race all subjects carried a pulse watch which registered the total number of heart beats.

Results: Novices had a higher BMI than experienced runners (BMI 25.9 ± 3.2 vs. 23.8 ± 2.6 kg/m²; p=0.04), they were slower (race duration 207 ± 38 vs. 174 ± 29 min; p<0.01) and released more troponin (median 0.03 [IQR 0.0150-0.06] vs. 0.01 [0.010-0.02]; p<0.01). The total number of heart beats differed between groups (32546 ± 5251 vs. 27785 ± 4367 beats; p<0.01). When adjusting for these differences in multivariable analysis, a significant association between inexperience and post-race troponin elevation (p=0.03) remained.

Conclusion: Post-exertional troponin release is higher in inexperienced than in experienced long distance runners. Though these groups differed in terms of BMI and total number of heart beats during the race, previous race experience was the only independent predictor of troponin release. This may reflect protective adaptations of cardiac physiology in experienced runners.

P404

Are recovery VO2 indices necessary for additional evaluation of ischemic patients by cardiopulmonary exercise test?E Klainman¹, A Yarmolovsky², R Vishnitzer², I Rosenberg², G Fink²¹Gefen Cardiac Health Center, Givatayim, Israel, ²Pulmonary Institute, Kaplan MC, Exercise Physiology U., Rehovot, Israel**Topic: Exercise physiology, testing and training****Objectives:** To assess the significance of recovery VO2 kinetics indices in testing of pts with various degrees of CAD, in relationship to the exercise cardiopulmonary indices.**Methods:** 62 male pts were divided into four groups according to their CAD degree: A:17 normal subjects (control); B:26 pts with one vessel disease (1VD); C:11 pts with 2VD; D:8 pts with 3VD. All pts underwent a cardiopulmonary exercise test (CPET), during which peak-VO2, peak-O2P and VAT, among others, were measured. The recovery indices measured were:1) Half time recovery(1/2tRec) of VO2; 2)1/2tRec of oxygen pulse(O2P); 3) Total time recovery of VO2 (TtRec-VO2), until RER reached value of 1 or less.**Conclusions:** Significant differences in the recovery indices of VO2 kinetics were observed among the pts with various degrees of CAD and seem to be even more significant than the exercise CPET indices. Such findings validate the recovery indices as an important addition for further functional assessment of CAD pts.**Table 1**

D(N=8)	C(N=11)	B(N=26)	A(N=17)	Group	
18.4+/-6.2	22+/-6.2N	22.5+/-6.6N	25+/-6.4*	Peak VO2 (ml/kg/min)	1)
12.5+/-3.2*	14.4+/-4.4*	16+/-5*	15.2+/-2.6*	Peak O2P (ml/beat)	2)
44+/-8	55+/-8*	62+/-11*	56+/-5*	VAT (% of VO2-max)	3)
134+/-18	123+/-36I	100+/-35	84+/-20*	1/2tRec-VO2 (sec.)	4)
174+/-40	162+/-37	123+/-34*	101+/-30*	1/2tRec-O2P (sec.)	5)
9.2+/-1.7	9.1+/-1.9	7.9+/-1.4*	7.6+/-1.3*	TtRec-VO2 (min.)	6)

P values : Significant: * vs I or ; vs . Borderline: * vs or N; vs I; I vs ; and vs N. Not Significant: * vs *; vs ; and N vs N.

P405

Increased exercise performance in patients with Ebstein's anomaly after surgical intervention

J Mueller, A Hager, J Hess

German Heart Center, Clinic at the Technical University of Munich, Munich, Germany

Topic: Exercise physiology, testing and training**Objective:** The purpose of the study was to assess whether patients with Ebstein's anomaly profit from surgical intervention with regard to exercise performance and quality of life.**Patients and methods:** In total forty-two patients with Ebstein's anomaly underwent a cardiopulmonary exercise test in our institution. At the redo test, twenty-one of them had undergone surgical intervention of their tricuspid valve and, if present, closure of an atrial shunt. The other twenty-one were free from surgical intervention in between the two tests.**Results:** Peak oxygen consumption increased significantly in the intervention group (9.1% vs. 1.7%, p=0.043) and slope was improved markedly (-2.9 vs. 0.8; p<0.001) in contrast to those in control group. Moreover, oxygen saturation increased significantly at rest (p=0.001) and under peak exercise (p=0.012). The improvements in cardiopulmonary exercise test parameters were correlated to peak oxygen consumption, ventilation efficiency and oxygen saturation but not correlated to the operation method, body mass and body height in the intervention group. Self-estimated quality of life was fairly good, but there were no significant changes when comparing the differences from pre- and post-testing of the two diagnostic subgroups.**Conclusions:** Patients with Ebstein's anomaly profit from surgical intervention and patients with a bad exercise performance had the greatest improvement in the redo test after surgical intervention.

P406

The first experience of passive physical trainings in elderly patients with myocardial infarctionA N AlexeySumin¹, AV Bezdenezhnykh¹, OM Baidina², TA Popova², OP Hayredinova²¹RAMS Scientific-Research Institute for Complex Studying of Cardiovascular Diseases, Kemerovo, Russian Federation, ²Scientific-Clinical Center of the Miners Health Protection, Leninsk-Kuznetsky, Russian Federation**Topic: Exercise physiology, testing and training****Purpose:** Aging is associated with progressive loss of neuromuscular function. Therefore aged patients with myocardial infarction (MI) especially require rehabilitation programs. Electrical stimulation of skeletal muscles (EMS) could represent a rehabilitation alternative for patients with chronic heart failure. The aim of study was to evaluate the EMS safety and efficiency in elderly MI patients.**Methods:** We examined 57 patients older than 70 yrs (75.4±0.6 years) with MI. In control group (n=25) the patients received only the usual program of phase I rehabilitations, in the EMS group (n=32) there was an additional EMS course - 2 times a day for 60 minutes within 10 days. After course of treatment patients were underwent bicycle ergometric test (VEM), six-minute walking test (6MWT) and Holter ECG monitoring with estimation of heart rate variability. The estimation of the left ventricular function was performed by echocardiography.**Results:** (see table) The EMS have resulted to more significant increase of maximal VEM workload, without anything influence on left ventricular volumes, number of extrasystoles and parameters of heart rate variability in Holter monitoring.**Conclusion:** Passive physical trainings with EMS result to significant increase of tolerance to physical loading without negative influence on systolic left ventricular function, autonomic and arrhythmic status. This method deserves the further application for rehabilitation of elderly MI patients.**Results of EMS in elderly MI patients**

Variables	EMS	Control	P value
6MWT (m)	213.4±100.8	136.4±80.3	0.01
VEM (W)	34.5±24.3	20.6±18.2	0.058
RPPmax (u)	136.9±56.0	115.7±53.7	0.276
EFLF (%)	43.4±8.5	46.0±9.5	0.363
EDVLF (ml)	127.5±25.6	133.1±53.0	0.673
SDNN (msec)	104.2±42.0	109.9±35.2	0.636
VES	202.6±438.6	161.6±500.3	0.774
SVES	235.3±402.6	443.2±1290.0	0.451

RPPmax rate-pressure product during maximal workload in VEM, EFLF left ventricular ejection fraction, EDVLF left ventricular end diastolic volume, VES - ventricular extrasystoles; SVES - supraventricular extrasystoles, SDNN time domain analyses of heart rate variability.

P407

Causes of positive exercise stress test in post PCI patients undergoing cardiac rehabilitation; are we missing something?

A Khan, A McGowan, R Boner, S Arnous, B Macneil, J Crowley, P Nash, K Daly

University Hospital Galway, Galway, Ireland

Topic: Exercise physiology, testing and training**Purpose:** Controversy exists regarding the diagnostic accuracy, optimal technique, and timing of exercise testing after percutaneous coronary intervention (PCI). The objectives of the present study were to analyze variables resulting in a positive exercise stress test (EST), in post PCI patients, undergoing cardiac rehabilitation.**Methods:** We performed a retrospective analysis of 116 patients who underwent percutaneous coronary revascularization and performed exercise stress test after 6 weeks, before undergoing cardiac rehab. 58 patients had a positive exercise stress test while 58 had negative EST. Demographics, diagnosis on admission, co-morbidities such as DM, HTN, CCF, smoking status, cholesterol level, diseased arteries, treated and untreated disease, angioplasty, number and types of stents used, symptoms and ECG changes during stress test, CABG and repeat angiogram results were compared between the groups. Diseased artery was defined as ≥25% stenosis in a coronary segment. Exercise stress tests were classified as positive or negative according to ACC guidelines.**Results:** In the positive EST group, only 7(12%) had single vessel disease while 51(88%) had multivessel disease and stenting - p<0.01. In the negative stress test population 52(90%) had multivessel disease while 6(10%) had single vessel disease. There was no significant statistical difference (p>0.5) between status of DM, HTN, CCF, MI, smoking, cholesterol level, untreated diseased arteries, usage of bare metal or drug eluted stents.**Conclusions:** The results of this study show that patients with single vessel disease, who remain symptom free after revascularization, are unlikely to get a positive stress test. In the absence of symptoms, positive EST is likely to represent minor residual coronary artery disease in revascularized patients. The presence of cardiac risk factors doesn't seem to play a significant role in determining the test result.

POSTER SESSION III

Basic science: translational science

Friday, 7 May 2010, 08:30–12:30 Location: Poster Area

P408

Coronary heart disease with depression and studies of serum interleukin-6 level

G Maimaitiming

First Affiliated Hospital of Xinjiang Medical University, Urumqi, People's Republic of China

Topic: Behavioural medicine

Objectives: This study was conducted to explore the relationship between interleukin-6 (IL-6) and coronary heart disease with depression, and sought prognostic role of IL-6, in order to come up with intervention strategy on treating coronary heart disease patients who were developed depression. **Methods:** 90 patients with coronary heart disease were recruited into our study, according to ZUNG self depression scale (SDS) score, subjects were divided into two groups as, coronary heart disease with depression (group A) and coronary heart disease without depression (group B).

Results: 57.78% of subjects had varying degree of depression, patients with mild depression were 24 (26.67 %), patients with moderate and severe depression were 28 (31.11%); 57.59% of male patients had depression, and 57.89% of female patients had depression, there was no statistical difference between two genders when compare the concomitance rate of depression ($P < 0.05$); The levels of serum IL-6 in the A group [M(P25, P75)] were [0.04(0.01, 0.06)] ng/ml, B group were [0.02(0.01, 0.05)] ng/ml, group A were significantly higher than the B group ($P < 0.05$); In the group A, the levels of serum IL-6 patients with moderate and severe depression were [0.05(0.02, 0.08)] ng/ml higher than in patients with mild depression [0.04(0.01, 0.05)] ng/ml, ($P < 0.05$); In the group A the serum IL-6 levels was positively correlated with cholesterol/low-density lipoprotein?C-reactive protein and left ventricular internal diameter at the end diastolic left ventricular internal diameter ($P < 0.05$), negatively correlated with left ventricular ejection fraction ($P < 0.05$), there was no obvious correlation with triglyceride and high-density lipoproteins. In the group B the serum IL-6 levels was not obviously correlated to cholesterol/triglyceride/low-density lipoprotein/high-density lipoproteins, C-reactive protein, left ventricular internal diameter at the end-diastolic and left ventricular ejection fraction.

Conclusion: The concomitance rate of depression in the coronary heart disease patients were higher, the level of serum inflammatory markers in coronary heart disease patients with depression were higher than coronary heart disease patients without depression; In moderate to severe depressed patients with higher levels of inflammatory markers than in mild depression patients. Depression is a sign of activation of inflammatory responses; inflammatory responses play invariably role in coronary heart disease with depression.

Key words: Coronary heart disease; Depression; IL-6.

P409

Prevention of oxidative-nitrosative stress activity by atorvastatin at high dose in patients undergoing aorta-femoral bypass operation

Y V Shchukin, AN Vachev, EI Selesnev, EA Medvedeva, EA Surkova, II Berezin

Samara State Medical University, Samara, Russian Federation

Topic: Lipids and atherosclerosis

Objective: To study atorvastatin influence on the molecular mechanisms of decrease in oxidative-nitrosative stress, which is the pathogenetic factor for cardiac complications after the aorta-femoral bypass (AFB) operation.

Methods: 126 patients with atherosclerosis undergoing AFB operation, were included in the study. The intensity of oxidative-nitrosative stress was determined by the levels of oxidized low-density lipoproteins (ox-LDL), 3-nitrotyrosine (3-NT) and secretory phospholipase A2 type IIA (sPLA-A2 IIA) activity. Antioxidant protection system was estimated by glutathione peroxidase (GPx), extracellular superoxide dismutase (EC-SOD) activity and the level of protein thiol (-SH) groups. The postoperative myocardial ischemia was determined by means of electrocardiography monitoring (Holter). Patients were divided into two groups: 1 group - 62 patients received atorvastatin 60 mg per day during 10-15 days before operation, 2 - 64 patients were prepared in traditional way. The control group included 36 healthy people.

Results: Before treatment we found increase of oxidative-nitrosative stress in both patients groups. After atorvastatin treatment we observed increase in activity of GPx (24%, $p < 0.05$), EC-SOD (22%, $p < 0.05$), level of protein thiol (-SH) groups and decrease in level of 3-NT (27%, $p < 0.05$), ox-LDL - (24%, $p < 0.05$), sPLA-A2 IIA - (23%, $p < 0.05$). In the second group changes were not observed. On the first day after operation indicators of oxidative stress were increased in both patients group, but in the first group less than in the second group difference between groups was 35-40%. We also found increase in the rate of postoperative myocardial infarction and ischemia in the second group in comparison with the first one.

Conclusion: Preoperative atorvastatin significantly reduces adverse cardiac events after AFB operation in patients with atherosclerosis. It may be connected with reduction of vascular and myocardial oxidative-nitrosative stress.

P410

Combined effect of genetic factors, vitamin status and renal function on plasma homocysteine level in Russian patients with stable CAD

OO OlgaShakhmatova¹, AL Komarov¹, DV Rebrikov², I Kofiady², TI Kotkina¹, AV Bolvacheva¹, EP Panchenko¹

¹Russian Cardiology Research & Production Center, Moscow, Russian Federation, ²DNA-technology, Moscow, Russian Federation

Topic: Genetic-environmental interactions

Moderate hyperhomocysteinemia is an important risk factor for CAD. Common polymorphisms (MTHFR C677T, MTHFR A1298C, MTR A2756G, MTRR A66G, TCN C776G) and some clinical factors (reduced folat and cobalamin level, diabetes mellitus (DM), renal insufficiency and atherosclerotic burden) may contribute to increased homocysteine (Hcy) level.

Purpose: To investigate clinical and genetic determinants of hyperhomocysteinemia in Russian pts with stable CAD.

Methods: 506 pts (388 male, age 59.4 ± 12.2 years) with stable CAD were enrolled. Atherosclerosis in other vascular beds (cerebrovascular and peripheral vascular diseases) was assessed. Renal function was estimated by creatinine clearance (CrCl), Cocroft-Gault formula. Hcy, folat and vitamin B12 plasma concentrations were measured. Polymorphisms were detected based on the real-time PCR.

Results: Mean Hcy was 14.3 ± 4.6 μ mol/l. 432 (85.4%) pts had hyperhomocysteinemia (Hcy > 10 μ mol/l). The frequency of polymorphisms was as follows (hetero-/homozygote): MTHFR 677T 43.3/8.5%, MTHFR 1298C 43.3/12.4%, MTR 2756G 37.0/17.2%, MTRR 66G 38.7/23.6%, TCN 776G 44.7/22.3%. Prevalence of other factors of interest was: low folat plasma level (< 7.2 ng/ml) - 55.5%, low B12 plasma level (< 200 pg/ml) - 9.7%, DM - 19%, CrCl < 90 ml/min - 53.4%, coexisting CVD and/or PAOD - 28.8%.

According to univariate analysis, Hcy was related to folat plasma level (Spearman rank -0.23 , $p < 0.0001$), B12 plasma level (Spearman rank -0.24 , $p < 0.001$) and renal dysfunction (Hcy level: 15.2 μ mol/l for CrCl < 90 ml/min vs 13.5 μ mol/l for CrCl > 90 ml/min, $p < 0.02$). According to ANOVA with continuous covariates (using the nested models), folat plasma level (beta-coefficient -3.86 , $p < 0.0001$), cobalamin plasma level (beta -5.73 , $p < 0.0001$) and MTRR 66AA genotype (beta 10.71, $p < 0.0005$) were the only three independent predictors of hyperhomocysteinemia. Also Hcy level was related to some combined conditions: MTRR 66G mutation + folat plasma level (beta 1.12, $p < 0.0001$), MTRR 66AA genotype + cobalamin plasma level (beta 0.012, $p < 0.0001$), TCN 776G mutation + cobalamin plasma level (beta -0.03 , $p < 0.0001$), TCN 776G mutation + folat plasma level (beta 0.58, $p < 0.0009$), MTR 2756G mutation + cobalamin plasma level (beta 0.004, $p < 0.002$), MTRR 66G mutation + CrCl < 90 ml/min (beta 0.08, $p < 0.001$) and TCN 776G mutation + CrCl < 90 ml/min (beta 0.07, $p < 0.0007$).

Conclusion: In Russian pts with stable CAD Hcy level is related to vitamin plasma concentrations, MTRR66AA genotype and MTR 2756G, MTRR 66G, TCN 776G mutations with account taken of vitamin status and renal insufficiency.

P413

Acute exercise increases paracrine activity of circulating angiogenic cells in sedentary patients with chronic heart failure

E Van Craenenbroeck, V Hoymans, P Beckers, N Possemiers, C Vrints, V Conraads

Antwerp University Hospital, Edegem, Belgium

Topic: Exercise physiology, testing and training

Purpose: The production of angiogenic cytokines is one of the putative mechanisms by which circulating angiogenic cells (CAC) participate in maintaining normal structure and function of the endothelial cell-layer. Migratory capacity of CAC is impaired in patients with CHF. This functional deficit might partially explain endothelial dysfunction, which characterizes CHF patients and determines exercise capacity. The paracrine function of CAC has not been investigated in CHF. Therefore, we studied the production of vascular endothelial growth factor (VEGF) by CAC obtained in CHF patients and healthy subjects. Furthermore, the effect of a single exercise bout, known to improve CAC migratory capacity, was studied.

Methods: Venous blood was sampled from 21 sedentary CHF patients and 5 healthy subjects before and after a graded exercise test (GXT). Peripheral blood mononuclear cells were cultured for 7 days in an endothelial cell medium (EGM-2MV) to generate acLDL+UEA-I+CAC. After 7 days, migratory capacity towards VEGF and SDF-1a was assessed in vitro. For paracrine activity, cultured CAC were switched to basal medium (no supplemental growth factors) for 72 hours. Conditioned media were collected and assayed for VEGF using ELISA. Supernatant from human dendritic cells served as negative controls.

Results: Compared to dendritic cells supernatant (no VEGF detected), VEGF levels in supernatant of CAC cultures from healthy subjects ranged from 75.0 to 143.6 pg/ml. VEGF concentration was significantly lower in supernatant obtained from CAC from CHF patients (61.7 ± 11.0 pg/ml, mean \pm SD) compared to controls (101.3 ± 12.0 pg/ml, $p = 0.05$). Acute exercise significantly affected VEGF production by CAC. In healthy subjects, VEGF levels decreased with 41.5 ± 7.4 % post-GXT, whereas in the CHF group an increase of 24.8 ± 16.1 % was observed ($p = 0.002$). Migratory capacity towards VEGF and SDF-1a showed a similar pattern. There was a significant correlation between the change in VEGF levels and the change in migratory capacity following GXT ($p = 0.004$, $r = 0.541$).

Conclusion: Paracrine activity of CAC is impaired in CHF patients and this deficit could contribute to impaired endothelial repair and hence, endothelial dysfunction. Acute exercise is a powerful stimulus to improve CAC paracrine function in these patients.

(W) P414**Comparison of predicted dose vs. actual dose using pharmacogenomic algorithms in 483 patients on long term warfarin therapy**B Diug¹, L Sheffield², M Dooley³, J Lowthian¹, S Evans¹, E Maxwell⁴, A Street³, J Mcneil¹¹Monash University, Melbourne, Australia, ²Murdoch Childrens Research Institute, University of Melbourne, Melbourne, Australia, ³The Alfred Hospital, Melbourne, Australia, ⁴Melbourne Pathology, Melbourne, Australia**Topic: Genetic-environmental interactions****Purpose:** This study aims to compare the predicted dose against the actual dose using pharmacogenomics in patients on long-term warfarin therapy in the community. Previous studies have focussed on pharmacogenomics during initial titration phase however, there is limited information on its impact on maintenance dosing in patients on long-term warfarin therapy.**Method:** A case control study was conducted with patients recruited by a metropolitan pathology provider. Warfarin predicted dose was calculated by application of two pharmacogenomic algorithms. Actual dose was attained from the patient and confirmed by the pathology provider whereby mean absolute percentage error was calculated (MAPE). Cases had an elevated INR = 6.0 whilst controls were within their therapeutic range for at least 3 months. Patient interviews investigated demographic and clinical risk factors, time in range and dosage. Height, weight, waist circumference were measured with DNA obtained through a cheek brush sample for analysis of genes CYP2C9 and VKORC1.**Results:** A total of 483 patients were recruited: 156 cases (mean age 75.4 yrs, range 25-96) and 327 controls (mean age 75.5 yrs, range 36-92). Primary indication for long-term warfarin therapy was atrial fibrillation (55%) and the predominant race was white (85%) in this cohort. Patients had a mean height of 167cm (139-198), mean weight of 79.5kg (36-175). Duration of therapy showed no difference between the two groups with cases on warfarin for a median of 4 years (0.3-31) and controls 5 years (0.3-31). Mean dosage for cases was 4.5 mg (1-12) whilst controls were 4.3 mg (0.75-14.5).**Conclusions:** Our findings show no difference between the results from the NEJM and Gage algorithms. However, MAPE showed significant variations between expected and predicted dosages between our cases and controls in community-based patients on long-term warfarin maintenance therapy. Further, assessment of these findings is required.

	Cases n=156MAPE(95%CI)	Controls n=327MAPE (95%CI)	TotalMAPE(95%CI)
GAGE (2008)	33.2(36.1-40.1)	20.4(21.9-26.5)	27.1(24.4-29.8)
NEJM (2009)	32.3(27.1-37.6)	20.9(24.4-29.0)	28.5(26.2-30.8)