Teaching of cardiovascular prevention and rehabilitation in European medical schools: 2009 results of a first institutional survey

P Marques-Vidal1, H Satter2
1University Hospital Center Vandoe, Lausanne, Switzerland, 2Bern University Hospital, Cardiovascular Prevention and Rehabilitation, Bern, Switzerland

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 survey

P Marques-Vidal, H Satter

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 Teaching of CVP&R is low in European medical schools, and the courses provided were short and did not follow the educational framework to ensure adequate training in CVP&R throughout Europe. Results: One hundred and twenty medical schools (32% response rate) answered. Forty-three percent of medical schools teaching CVP&R in 32 (77%) 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 (80%), physical activity (85%), 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 Pogosovna, RG Ogatov, IY Koltunov, VA Vigidin, YO Sokolova

National Center for Preventive Medicine, Moscow, Russia

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 REELIF (REgentulare Lechtem i proFilakètikà) has been performed in 20 big cities of Russia: in each city were randomly selected 5 polyclinics, in each polyclinic 5 general practitioners (GP’s). All GPs (N=512) filled out questionnaire concerning 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 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 62.8% 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, 53.9% dyslipidemia, 44.42% low physical activity, 40.13% family history of premature coronary artery disease, 39.76% dyslipidemia, 36.61% hypertension and 33.06% diabetes. Conclusion: 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 “porkide, 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 “porkide, 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<0.001), 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).

P327
Adherence to the Mediterranean dietary pattern is inversely associated with small dense low-density lipoprotein (dLDL) phenotype B: the ATTICA Study

CM Kastorini1, DB Panagiotakos2, C Chrysohoou2, C Pitsavos3, J Skouma3, S Vellas2, M Kambasi2, C Stefanadis2
1Harokopio University, Athens, Greece, 2Hippokration 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 1314 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 (dLDL-cholesterol) and dLDL-cholesterol (apo B) ratio was calculated using the formula: (0.94*cholesterol/0.94*HDL+0.94*apo B)apo B. Results: After controlling for several potential confounding factors, participants in the lowest tertile and in the second tertile of the Med-DietScore (i.e., <, lower adherence to the Mediterranean diet), had lower LDL-cholesterol/dLDL-cholesterolapo B ratio, compared with those in the highest tertile (B=0.063; p=0.012 and B=0.048; 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/dLDL-cholesterolapo B ratio below the median, i.e., 1.35, compared with those who followed a more western diet.

P328
HAPIEE study: Dietary patterns and their association with socio-demographic factors in Lithuanian urban population

DJ Lukšienė, M Bucervienė, A Tamusišius, R Radžiūskas, R Reklaitienė, E Dau­geliete
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 registries. 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 “porkide, 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 “porkide, 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<0.001), 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.
Diabetes is associated with a significant increase risk in the development of cardiovascular disease (CVD). While recent studies indicate that not consumption can improve CVD risk factors in hypertensive 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): 75 g/d for 2,000 kcal/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 = 0.008). 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 blood lipid and 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 Kastorini, C Chrysohoou, DB Panagiotakos, P Aggelopoulos, C Pitavos, C Stefanadis**

1. Harokopio University, Athens, Greece, 2. Hippokration 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 analyses after adjustment for various confounding factors revealed that in patients with first coronary event, plant protein intake in the third quartile of consumption was associated with an 86% (95% CI: 1.17-6.95) 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 21% greater likelihood of developing LVSD (95% CI: 1.08-9.96), 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 framework 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 database was randomly selected. In 30% of subjects sample (3006 men and 3401 women) Hcy level and nutrients were performed according to study protocol.

**Results:** Average intake of vitamin B6 ranged from 2.26 m in men to 2.03 mg/day in women, of vitamin B12 from 5.85 to 4.69 g/day and folate from 258 to 211 g/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 hyperHcy (Hcy >12 µmol/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 hyperHcy were observed.
In this double-blind, placebo-controlled trial, 2487 subjects were randomly assigned to PHEN/TPM is a low-dose, controlled-release combination of phentermine and topiramate. 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.

Methods: A total of 6,510 participants (42% women) were recruited. Among urban, migrant and rural men the age and factor adjusted percentages classified as obese (BMI 25-29.9 kg/m2) were 41.9%, 37.8%, and 19.0% respectively and diabetic was 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.

Selenium deficiency is associated with adverse vascular function in patients with high risk for cardiovascular events

Methods: We studied 306 consecutive patients with high risk for vascular events (coronary artery disease 55%, acute coronary syndrome not acute MI 40%, diabetes 59%). 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 μg/day. Mean baPWV was 1762.4 ± 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 ≥ 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, calorie 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.

Migration status: obesity and diabetes

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

12-month weight loss and triglyceride changes with PHEN/TPM in overweight and obese subjects with hypertriglyceridemia

Methods: In this double-blind, placebo-controlled trial, 287 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 287 subjects randomized to study treatment were female (79%) 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 hyperglycemic/diabetic. Mean weight loss at 26 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 13.3% for the placebo, 7.546 mg, and 15.92 mg groups, respectively (p < 0.0001). Subjects with hyperglycemia 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 = 0.008 for PHEN/TPM and 0.005 for placebo). For subjects with hypertriglyceridemia (baseline TG 253 mg/dL, 2.63 mmol/L), the mean percent change in fasting triglycerides at Week 56 with LOCF was –9.4% with placebo, –25.7% 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.

Conclusion: 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.
Prevalence of metabolically healthy obesity in a Swiss population-based cohort
S Velho1, P Marques-Vidal1, F Paccaud1, G Waeber1, P Vollmer2
1University Institute of Social and Preventive Medicine Lausanne (IUSMP), Lausanne, Switzerland
2University Hospital Center Vaudens, 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 2663 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% according to the two sets of criteria. Moreover, prevalence of MHO using set 1 was 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 (21.6% vs. 15.9%, p<0.001), and between-gender differences in prevalence were more pronounced when considering BMI and waist circumference than body fat.

Conclusion: 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.

Effects of an in-patient lifestyle programme for overweight and obese children
M Raits1, N Milosavljevic1, H Langhof1, F Paccaud1, W Ketterle1, M Halle2
1Technical University of Munich, Munich, Germany
2University of Ulm, Ulm, Germany

Topic: Obesity

Purpose: Plasma concentration of leptin, an adipokine secreted by adipocytes, is increased in overweight and obese children and links 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±23.1 kg to 84.0±21.4 kg (p<0.001). Leptin levels decreased significantly from 39.5±2.4 mg/l to 36.8±4.4 mg/l (p<0.001). In addition, we found an increase in relative exercise capacity from 1.66±0.40 to 2.04±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 lifestyle 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 changes in physical exercise capacity. Leptin therefore seems to be independent of exercise capacity.

Trends in overweight and diet among Russian adolescent population
D Denisova, L Zavyalova, M Voedova
Institute of Internal Medicine, Siberian Branch of the Russian Academy of Medical Sciences, Novosibirsk, Russian Federation

Topic: Obesity

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

Methods: According to the International Obesity Task Force (IOTF) cut-offs recommended by the International Obesity Task Force, overweight was defined as BMI>84th percentile for age and gender, and obesity as BMI>97th percentile. Prevalence of MHO was assessed for three obesity markers (body mass index, waist circumference or body fat).

Results: We conducted a randomized prospective study of 6 months on 94 voluntary students, Among obese (BMI=30 kg/m2) participants, prevalence of MHO was 18.8% and 7.3% according to the two sets of criteria. Moreover, prevalence of MHO using set 1 was 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 (21.6% vs. 15.9%, p<0.001), whereas the increase of relative exercise capacity was not associated with changes in leptin (p=0.0001). We also noticed an increase of the oxygen pulse (VO2/HR) and a reduction of body fat mass.

Conclusion: 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.

Supervised exercise training benefit on physical fitness in young metabolic syndrome patients
C Aviram1, M Gravitán1, LD Hohle1, E Bota1, S Voicu2, D Gáiță2
1West University Timisoara, Timisoara, Romania, 2Vactor Babes University of Medicine and Pharmacy, Timisoara, Romania

Topic: Obesity

Objective: 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 increased physical activity. The purpose of this study was 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 evaluated 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) 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 1.91 to 1.55 L/min, P<0.0001; VO2 at RCP increased from 1.66 to 1.96 L/min, P<0.0005 and VO2peak increased from 9.3 to 11.3 L/min, P<0.0001. We also noticed an increase of the oxygen pulse (VO2/HR) and improved indices of cardiac performance in exercise from 10.3 to 11.7 mL/min per 100, P<0.0001. Finally, we found 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.

Conclusion: 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.
The metabolic syndrome (MS) in adults is associated with an increased risk for 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 ultrasonography (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 dry weight 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±8 vs 47.9±9 years, p=ns). As has been expected, waist circumference (103.8±8 vs 95.10±10 cm, p<0.001), TG (272.86±125±81 mmol/l, p<0.001), fasting glucose (104.9±36 vs 85.12±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 (33±23.0 vs 22.6±38.2 IUL/l, p=0.001), AST (23±4.10 vs 20.9±7.6 IUL/l, p=0.038) and GGT (32±2.23± vs 23.7±19 IUL/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 (5.29±8.9±6, p=0.01 for ALT, 15.4±6 vs 9.2, p=0.047 for AST, 5.20±9±5.4, p=0.001 for GGT). Liver US showed steatosis in 28.5% of subjects with elevated ALT or AST. GGT.

Conclusions: This study suggests 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 Tamsovinia, R Reklaitiene, E Daugeliene, R Radisaius
Kaunas 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: Non-random sample of 715 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 the international HAPFEE (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 WHODQOL-Lithuanian questionnaire. The relationship between body mass index (BMI) and lifestyle-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 85% 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<0.01) 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 fruits and vegetables and lower amounts of successes (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 61.7 and 69.6%, women 58.0 and 62.3% respectively, p<0.05). Obese and overweight respondents 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 Celio 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/height²).

Methods: Forty-eight volunteers were divided into three groups according to their BMI as follows: NW group (normal weight), 18.5-24.9; OB 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, 0.0-0.15 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±6% vs. 36±8%) and HF (65±6% vs. 60±7%) oscillations. However, OW group had an increase in LF (46±6% vs. 81±14%) and HF (44±7% vs. 61±75%) oscillations, whereas OB group had a decrease in LF (28±25% vs. 19±10%) and HF (83±5% vs. ±70±45%) oscillations.

Conclusion: Our results suggest that regular physical activity has a beneficial effect on the autonomic neural 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 Tyrovolas, T Paliouroupoli, G Poumis, N Papaizaklou, V Bountziouka, A Zeimpekis, E Gotsis, M Antonopoulou, G Metaxinos, E Polychronopoulos, C Lionis, DB Panagiotakos
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 Mitilini, Mitilini, Greece, University 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, 353 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 demography, 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 0.78-0.85) 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 0.77-0.83) 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.

Conclusion: 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.
The healthy knowledge of obese persons, do they know more about cardiovascular diseases prevention? Results of WOBASZ Study
A Piontowska, E Szydwolska, W Drygas
Institute of Cardiology, Warsaw, Poland

Purpose: Obesity is one of main risk factors (RF) of CVD morbidity and mortality, because many proven CVD risk factors, like f. e. hypertension, lipids 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 PM.

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

T Couffinhal1, P Latry2, M Molinar3, B Begaud2, M Laffont4, K Martin-Latry5
1Université Hospital of Bordeaux - Hospital Haut Lecou, Department of Cardiology, Pessac, France, 2Direction Regionale du Service Medical de l'Assurance Maladie d'Aquitaine, CNAMTS, Bordeaux, France, 3Inserm U 657, Université Victor Segalen Bordeaux 2, Bordeaux, France

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 factors and 47% had at least three risk factors. All the parameters showed a suboptimal adherence whatever the group: days covered ranged from 56% to 72%, regularity ranged from 23% to 35% 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.

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

A Pavlidis, G Kolovou, K Anagnostopoulou, P Petrour, K Sorolidou, A Valaora, K Salpea, D Cokkinos
Onassis Cardiovascular Surgery Center, Athens, Greece

Background: Postprandial lipemia (PPL) 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 FH and compare them to FH and healthy subjects.

Methods: The study population consisted of 83 subjects. OFTT was given to 34 men with FH, 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: FCHA (n = 13), FCHB (n = 10), FCH IV (n = 11), FIIIA (n = 21), and FIIIB (n = 8). TG concentrations were measured before, 2, 4, 6, and 8 h after OFTT and the postprandial response was evaluated by the area 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; 2079±614.5 vs. 1550±1142 and 1191±652 respectively, p < 0.001). The postprandial TG levels were significantly increased in FCH IV and FCHB groups compared to FCHA (AUC in mg/dl; 3209±254 vs. 3409±770 and 1633±557 respectively, p < 0.001). FCHB group demonstrated higher TG levels at 2, 6, and 8h, compared to FH IIIB group (p = 0.05, p = 0.017 and p = 0.013 respectively). There were no significant differences between FH IIIB and FCH IB 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.

Familial hypercholesterolemia (FH) is an inherited 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 FH and compare them to FH and healthy subjects.

Methods: The study population consisted of 83 subjects. OFTT was given to 34 men with FH, 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: FCHA (n = 13), FCHB (n = 10), FCH IV (n = 11), FIIIA (n = 21), and FIIIB (n = 8). TG concentrations were measured before, 2, 4, 6, and 8 h after OFTT and the postprandial response was evaluated by the area 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; 2079±614.5 vs. 1550±1142 and 1191±652 respectively, p < 0.001). The postprandial TG levels were significantly increased in FCH IV and FCHB groups compared to FCHA (AUC in mg/dl; 3209±254 vs. 3409±770 and 1633±557 respectively, p < 0.001). FCHB group demonstrated higher TG levels at 2, 6, and 8h, compared to FH IIIB group (p = 0.05, p = 0.017 and p = 0.013 respectively). There were no significant differences between FH IIIB and FCH IB 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.
In 3710 patients (median age 65.0 years old, 47.3% women, 69.0% with hypertension, < 18.0 vs. ≥ 577, was 34.4, 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.

P531
Prevalence of low HDL-C in statin treated patients with cardiovascular disease. The Dystipidemia International Study (DYSSIS-SPAIN)
E Alegria1, J Millan, C Gutierrez1, JV Lozano2, E Gonzalez-Salinas3, B Gonzalez-Timon3, G Vitard1, JR Gonzalez-Janetey1
1University 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, Vakencia, Spain, 5Mercor Sharp Dohme, Madrid, Spain, 6University Hospital General Gregorio Maranon, Madrid, Spain

Aims: The prevention of fatal/nofatal myocardial infarction in father before age of 60 and/or in mother before age of 65 (STATA).

Methods: 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 DYSSIS study.

Methods: Analysis of 3,710 Spanish patients included in DYSSIS, a cross-sectional study carried out with 23,063 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, < 18.0 vs. ≥ 577, was 34.4, 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.

PSS2
Family history of premature myocardial infarction is associated with higher blood pressure in middle aged women
J Pinha1, M Lejskova2, J Butorac2, Z Cubranic2, E Azziz-Papac1, V Perse1, S Zecova1, Z Cubranic2, L Kunisek1, 1 Institute of Clinical and Experimental Medicine, Prague, Czech Republic, 2 Institute for Postgraduate Medical Education, 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 9% of population sample (n = 883) underwent complete evaluation of cardiovascular risk factors. Positive family history was defined as a history of familial premature 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 χ2 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 = 0.048), had substantially higher systolic and diastolic blood pressure (125.5 ± 18.0 mmHg vs. 118.3 ± 18.0 mmHg, p = 0.009 and 82.1 ± 10.0 mmHg vs. 78.1 ± 10.0 mmHg, p = 0.002), we also found weak evidence, that they had slightly higher plasma non-HDL cholesterol (4.1 ± 1.1 vs. 3.9 ± 0.9 mmol/l, p = 0.066) and apolipoprotein B (1.1 ± 0.3 vs. 1.0 ± 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.

Conclusions: 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.

P533
Do particular types of left ventricular hypertrophy influence the duration and dispersion of QT interval in hypertensive patients?
J Kunicki1, L Zaputovic1, Z Cubranic2, L Kunicki3, V Perse3, S Ruze1, M Zuvic4, N Stipanic5, S Vuciekovic1
1Thalassotherapia Opatija, Opatija, Croatia, 2Clinical Hospital Center Rijeka, Rijeka, Croatia, 3University of Rijeka, Technical Faculty, Rijeka, Croatia

Topic: Hypertension

Aims: 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 QT intervals and dispersion of QT intervals) of that phenomenon particular in relation to the asymmetric type.

Methods: During the 5.5 years, 138 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 (LVPW = 13-14mm), eccentric (LVPW ≥ 15 mm, LVPW/LVDD ≥ 0.45, asymmetric (LVPW/LVDD < 0.45, and three subgroups according to the degree of LVH mild (IVS or LVPW < 11 mm), moderate (IVS or LVPW 11-14 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±4.3 ms and 425±4.4 ms, respectively), while the QT dispersion was normal (13.5±19.1 ms). The QTc interval and QT dispersion were increased in severe concentric and eccentric LVH (441 and 480 ms for QTc, 53 and 45 ms for QTc dispersion, 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).

Conclusions: 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.
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 years. 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 BP 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 lpm vs −11 lpm; p 0.01) after the last session. IT group had a greater reduction of daytime (−165 vs 7 lpm; p 0.02) and nighttime (−19 vs 8.006 diastolic blood pressure, and lower daytime (−12 vs 9.007) and nighttime (−15 vs 6.002) heart rate than ET group. Conclusion: 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 syn- drome (MS) depending on blood pressure (BP) and intima-media thickness

O Rekovets, YM Sirenko, SY Savitsky, EA Pavluyk, GF Primal

National Scientific Center ‘M.D. Strazhesko Institute of Cardiology, MAS of Ukraine’, Kiev, Ukraine

Topic: Hypertension

Background: There is no clear relation between degrees of manifestation insulin resistance and increased blood pressure and atherosclerosis in patients with arterial hypertension (AH) and metabolic syndrome (MS).

Objective: to evaluate the changes of some characteristics of insulinsensitivity in patients with AH and MS and intima-media thickness and increased blood pressure.

Methods: We have included 162 patients (52 men and 72 women) with average age 50.3±10.0 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 performed oral glucose tolerance test (OOGT) 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: 86 patients (29%) had insulin resistance (IR) with HOMA > 2.89 patients (71%) had not insulin resistance (HOMA < 1). Patients with HOMA >3 had higher BMI 34.60 ± 0.82 kg/m2 than patients without IR 32.21 ± 0.60 mg/dl (p<0.001). Patients who had insulin resistance had higher BP than who did not showed insulin resistance: office BP 157.72 ± 1.36 vs. 156.16 ± 0.91 mmHg, p<0.001, office DBP 90.66 ± 0.80 vs 91.22 ± 0.38 mmHg, p<0.01. ABMP SBP 133.79 ± 2.12 vs 133.94 ± 3.35 mmHg, p<0.001, DBP 80.22 ± 1.45 vs 80.45 ± 1.09 mmHg. Patients with IR had higher cholesterol and TG and HDL less than patients without IR: cholesterol 6.79 ± 0.15 vs 6.25 ± 0.12 mmol/l, p<0.03, 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<0.05. Patients with IR had more aggressive atherosclerosis compared with 86 patients without IR. Patients with HOMA >3 had IMT 1.52 ± 0.01 ± 1.27 mm, p<0.001, who had HOMA < 1.

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 pregnancy

A Ascione, F Stoppolen, G Vernetti, A Sciarappa, M Borgia

Claude Bernard Fondazione Santa Cecilia Hospital, Naples, Italy, Vincenzo Mauddo 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 holder 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 146.3±9.8/88±1.7 mmHg. Treatment initiation began with metoprolol 250 mg/day and was doubled at 4 weeks in cases of inadequate BP control. If indicated, at 8-week-follow-up metoprolol 500 mg/day in the dose 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 = 0.02). Additionally, higher BNP concentrations were observed in patients with stage 2 hypertension compared with those with stage 1 (median 44.9 v s. 25.9 pg/ml, F = 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 to −4.4 vs. −96 to 10.9, respectively, P<0.01).

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.
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 Parky, 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 hyperten-sion treated with medications, and at finding whether a therapy with nimesulide 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 therapy with medications, and the abdominal obesity was found in 79% of the patients. The therapy with nimesulide 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 nimesulide 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<0.001). The coefficients of correlation between the systolic blood pressure values and the sleep quality in the morning, were -0.06 (p<0.020) 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 nimesulide 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 nimesulide 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 Hungary
S Szereti1, E Helis1, JG Fodor2, P Turton1, S Sonkodi2, B Sonkodi2
University of Szeged, 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±SD=32.5±8.1) were screened for their BP and other CV risk factors at their workplace. The respondents included 368 males (mean age±SD=30.9±6.4) and 696 females (mean age±SD=33.2±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 (Hoggy) and 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 hypertension 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 partial explanation for the excessive stroke mortality and unfavorable cardiovascular profile of Hungary compared with other European countries.

---

**Participant characteristics**

<table>
<thead>
<tr>
<th>Blood Pressure Class</th>
<th>Normotension</th>
<th>Prehypertension</th>
<th>Hypertension</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td>368 (36.8%)</td>
<td>459 (45.9%)</td>
<td>173 (17.3%)</td>
</tr>
<tr>
<td>Age, yrs</td>
<td>31.7±7.7</td>
<td>31.7±7.4</td>
<td>36.3±9.3</td>
</tr>
<tr>
<td>Waist Circumference, cm</td>
<td>75.6±9.8</td>
<td>78.8±11.3</td>
<td>86.4±14.1</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>22.3±3.3</td>
<td>23.1±3.9</td>
<td>25.1±4.5</td>
</tr>
<tr>
<td>SBP, mmHg</td>
<td>108.6±7.9</td>
<td>124.7±16.4</td>
<td>139.0±15.5</td>
</tr>
<tr>
<td>DBP, mmHg</td>
<td>70.1±6.4</td>
<td>80.6±7.4</td>
<td>92.5±9.6</td>
</tr>
<tr>
<td>HR, bpm</td>
<td>73.5±10.1</td>
<td>78.3±11.3</td>
<td>84.4±13.4</td>
</tr>
</tbody>
</table>

All data are shown as means: 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 Villasárlé, E Silva, G Berrizme
Instituto de Esferanoderodos Cardiacoquotes, 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 school students from Maracaibo, Venezuela. The participants were 560 adolescents, males (n=300) and females (n=250), age-mean = 14.19 years (SD=1.32), 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). The statistical analysis was done using the statistical software package for the Windows, version 13.0, including the one-way ANOVA. The significance of differences found between normal and depression groups was evaluated by post hoc Tukey test.

**Results:** The prevalence of MoD was 8.2% (n=46) and it was 28.9% (n=158) for MiD in all subjects. The systolic and diastolic BP values were: 103.1±10.3/75.3±7.6 mmHg in adolescents with MoD, 106.8±12.2/69.7±6.9 mmHg in subjects with MoD and 108.6±12.2/70.5±6.7 mmHg in N adolescents. The ANOVA showed statistically significant effects of the depression disorders on both systolic BP (F = 4.83) and diastolic BP (F = 4.38). The analysis post hoc revealed systolic and diastolic BP values statistically lower in adolescents with MoD than those with MiD (p<0.031) or N (p<0.011).

**Conclusions:** The present results provide evidence for an association between depression disorders and low BP in the adolescent population. This study do not evaluate 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.

---

Copyright © European Society of Cardiology. Unauthorized reproduction of this article is prohibited.
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 sociodemographic 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 Beltress II study with no history of CVD. Sociodemographic (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.

Results: Nondipping in systolic BP (SBP) was present in 22% and nondipping in diastolic BP (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 = 0.97-5.33), anxiety (OR = 3.52; 95% CI = 1.43-7.22) and vital exhaustion (OR = 2.34; 95% CI = 0.89-6.50), while nondipping in DBP was (borderline) significantly related to sleep problems (OR = 2.66; 95% CI = 0.58-4.80), job strain (defined as the ratio of demands over control) (OR per 1 SD in job strain = 4.00), high 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 bio-clinical examinations. On a regular working day, participants were 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.

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.
The spQRS-Ta was higher in the subjects with T2DM in comparison with the controls. Diabetic patients without previous known CAD had a higher mortality rate and a $\frac{1}{4}$ We investigated consecutive 112 ischemic heart disease patients who had been 10.7 $< 11.7$ years old, 64% males) with DM or known CAD Randomized, single-blind, placebo-controlled, parallel study. Age, sex, and body mass $\frac{1}{4}$ $0.75mm$, respectively). However, positive remodeling $\frac{1}{4}$, $P < 0.001$ by paired $t$-test) or when compared with placebo ($P < 0.024$, $P = 0.011$ for insulin and $P < 0.004$) 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 v 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 coronaryography. 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.

Type 2 Diabetes Mellitus: a true coronary artery disease risk equivalent? Y. Miyahisi, H. Adachi, J. Murakami, H. Hoshizaki, S. Oshima Gifu Prefectural Cardiovascular Center, Mishima, 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.

Methods: We investigated consecutive 112 ischemic heart disease patients who had been performed percutaneous coronary interventions (PCI) to mod-LAD (left anterior descending) lesions using IVUS procedure from May 2009 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 103.5mg/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 $\pm$ 0.70 vs 3.50 $\pm$ 0.75mm, respectively). However, positive remodeling ratio was significantly (p < 0.05) greater in DM group (149 $\pm$ 26) than in non-DM group (138 $\pm$ 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, D Dockw1, C O Loughlin2, M Lwedig1, K M Calland2
1 University College Dublin, School of Public Health, Physiotherapy & Population Science, Dublin, Ireland;
2 St Vincent’s University Hospital, Dublin, Ireland

Topic: Biomarkers

Background: B-type natriuretic peptide (BNP) has been profiled as a screening tool for echocardiography referral and detection of LVD. However, despite its excellent sensitivity there are concerns surrounding its post specificity and the significant issue of false positives. The literature has repeatedly established associations of higher BNP, however, there is a dearth of information on the magnitude of impact of these associations 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 associated 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 67, 470 Male, 66% Hypertension, 49% Hypercholesterolaemia, 25% Obesity, 16% Coronary artery disease—49% of whom had myocardial-infarction (MI), 15% Smoking, 13% Diabetes). The most common medications were Statins (61%), Anti-platelet (96%), Beta-blockers (36%), ACE-Indihitors (29%), ARB (26%), Thiazides (20%), Calcium-Antagonists (10%) and Anti-diabetics (11%). Median biomarker levels fell within normal ranges. Multivariate associates of BNP were age, sex, female, systolic and diastolic blood-pressure, heart-rate, beta-blockers, atrial fibrillation (<0.001), calcium-antagonist and MI (both <0.001).

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, co-morbidities and therapies must be accounted for. In addition to age referencing, not accounting for the 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 Lazzaro, 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 where 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. AG 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 52 (US 55%) showed impaired fasting glucose or impaired glucose tolerance and 88 (34.0%) where diagnosed as diabetics. Patients with an higher post-prandial glycaemia in the OGTT were older, less frequently in Killip class I on admission, had more often high blood pressure, dyslipidemia, 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 0.466; p<0.001) and worst for GN (coefficient 0.28; 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 Rottman
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).

Method: 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 Nt-proBNP and BNP were collected and stored frozen. Systolic HF was diagnosed in 46 patients (46% men, 54% women, mean age 79 years) while 64 patients (21% men, 79% women, mean age 76 years) had NO. We explored cut-off values for Nt-proBNP from 100 to 500 ng/mL partly based on FDA recommendations. To establish corresponding BNP cut-off values we analyzed the quotient between NT-proBNP and BNP in patients with both systolic and diastolic HF who had the highest median levels. This resulted in cut-off values for BNP from 50 to 30 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 (β=0.035; p=0.001) and BNP (β=0.036; p=0.001) were associated with age, but not with gender. In a multivariate analysis age (β=0.036; p=0.001) and male gender (β=0.270; p=0.014) were associated with Nt-proBNP, while age only significantly associated with increasing levels of BNP (β=0.0; p=0.001).

Conclusions: 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>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>Cut-off level</td>
</tr>
<tr>
<td>Nt-proBNP</td>
</tr>
<tr>
<td>200 ng/mL</td>
</tr>
<tr>
<td>88%</td>
</tr>
<tr>
<td>87%</td>
</tr>
<tr>
<td>20 ng/mL</td>
</tr>
<tr>
<td>96%</td>
</tr>
<tr>
<td>PPV</td>
</tr>
<tr>
<td>85%</td>
</tr>
<tr>
<td>88%</td>
</tr>
<tr>
<td>Specitivity</td>
</tr>
<tr>
<td>87%</td>
</tr>
<tr>
<td>71%</td>
</tr>
</tbody>
</table>

P374

Human growth hormone and IGF-1 in risk stratification of patients with acute myocardial infarction
M Pytlak1, V Varjogiu1, M Felsoci2, V Muchhira3, A Mandulakova1
1 National University Medical School Kosice, Slovensko, Republic; 2 Louis Pasteur University Hospital, Kosice, Slovensko Republik; 3 University in Vranov, and Toplice, Vranov and Toplice, Slovensko 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 38 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 cardiispecific 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 cardiispecific enzymes, and (if indicated) a negative ergometric examination during hospitalization. For the determination of GH and IGF-1 concentration, blood was collected in peracue phase of 4.5 hours to 36 minutes after the chest pain had appeared followed by the second specimen on the 7th day after AMI. Echocardiography was performed on the 7-th day of hospitalization.

Results: When compared patients with AMI with control group, their GH levels were significantly higher in peracue 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 (5.82±0.09 vs 4.48±0.07 ng/mL respectively). In the group of patients with AMI, GH levels were about 2-3-fold higher in peracue stage than on the 7-th day of AMI (1.42±0.25 vs 0.52±0.09 ng/ml, p<0.001). GH levels correlated positively with troponin levels in peracue phase (r = 0.68193, p = 0.005) 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 = 0.567241, p = 0.0005).

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

Topic: Biomarkers

Introduction: The heart-type specific Fatty Acid Binding Protein (h-FABP) is a small, cytosolic (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; 68 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-intervention time was 6 hours (range 1 to 24 hours). Echocardiography 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 pg/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 coronary angiography to confirm level of coronary artery stenosis.

Results: NSTEMI was finally diagnosed as 56 pts out of total 100 (56.5%). 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.

<table>
<thead>
<tr>
<th>Biomarkers</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Positive Predictive</th>
<th>Negative Predictive</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>h-FABP</td>
<td>96.4%</td>
<td>96.4%</td>
<td>96.4%</td>
<td>93.4%</td>
<td>98.0%</td>
</tr>
<tr>
<td>CK-MB</td>
<td>93.0%</td>
<td>93.0%</td>
<td>93.0%</td>
<td>90.0%</td>
<td>96.0%</td>
</tr>
<tr>
<td>cTnI</td>
<td>90.0%</td>
<td>90.0%</td>
<td>90.0%</td>
<td>87.0%</td>
<td>94.0%</td>
</tr>
</tbody>
</table>

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

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

A Astvatsatryan, M Senan
European Regional Educational Academies, 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 46.4 ± 21) with UA were included 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 (TC) 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 1739 pg/ml [76-46167], 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 < 0.01), while in Group P NT-proBNP remained at the same high level. The primary endpoint (a composite endpoint of death, non-fatal MI, rehospitalization for worsening angina at 20 weeks) was better in Group A: 13.8% vs. 18.5% (p < 0.05) but robust endpoints like death/MI were similar in both groups (12.2% vs. 11.9%, p = NS). The difference in the primary end-point was driven by rehospitalization for recurrent angina (3.5% vs. 8.9%). During all follow up, T.C drops more significantly in Group A. On the end of follow up TLC became normal in 10 pts (49.9%) in Group P and 16 (72.7%) in Group A (p < 0.03) without significant hepatic enzyme elevation.

Conclusion: Near normal NT-proBNP values or their rapid decrease within first 24 hrs of the treatment suggests a high risk pts. A seems to be more preferable than P in pts with UA.

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

A Holvand, R1 Hardersen, TE Molinés, KT Lappegaard
Stenfeld Hospital, Rudo, Norway

Topic: Biomarkers

Purpose: Low density lipoprotein (LDL) apheresis is well established in hypercholesterolemia otherwise uncontrolled. This treatment affects biomarkers of importance in atherosclerosis. However, systematically compared the different apheresis columns.

Method: 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%, 65% 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-18 and IL-10 with the whole blood column DL75, and the decrease in TNF-alpha 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 C3abut left C5a-levels unchanged. The other two columns gave a modest increase in IL-6 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-a 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

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>IL-1ra</th>
<th>IL-6</th>
<th>IP-10</th>
<th>MCP-1</th>
<th>MIP-1b</th>
<th>TNF-alpha</th>
<th>VEGF</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL75</td>
<td>2.2</td>
<td>1.2</td>
<td>2.9</td>
<td>0.9</td>
<td>0.7</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>LA15</td>
<td>1.8</td>
<td>1.3</td>
<td>1.4</td>
<td>0.9</td>
<td>0.7</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>EC50W</td>
<td>1.4</td>
<td>0.9</td>
<td>1.7</td>
<td>1.5</td>
<td>0.6</td>
<td>0.8</td>
<td>0.4</td>
</tr>
</tbody>
</table>

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 Okamura1, Y Kono3, E Mizore2, T Inuma3
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

**Topic:** Cardiac rehabilitation

**Objective:** This study 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 function in patients with CHF: (PTMe+TC) 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 (P-ADL)-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 univariate 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 PTMe+TC study and the data of 140 subjects who answered the three points (1, 3, 5 months) were analyzed in this study. More than half reported “somewhat hard” or “very hard” in each item (activities of daily living) of the P-ADL-8. Worse functional limitations was associated with a more severe depressive symptoms (r = 0.46, P < 0.001) and lower grip strength (r = -0.40, P < 0.001). Depressive symptoms and grip strength accounted for 33% of the variance in functional limitations at 5 months post-discharge (P < 0.001). In two-way ANOVA, depressive symptoms significantly had the effect on the course of functional limitations (F = 30.7, P < 0.001) but no interaction with time (F = 1.06, P = 0.35). 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 < 0.001).

**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 Zoraide
Simon Bolivar University, Caracas, Venezuela

**Topic:** Cardiac 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:** Discriminatory 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 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 Stewart11, M Tan2
1National Heart Foundation of New Zealand, Auckland, New Zealand; 2Te Huto Manawa Moari, 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 readdress this, the Heart Foundation of New Zealand and the Maori equivalent, Te Huto Manawa Moari 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 evaluation 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 HEAs 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, DMDSD Duda-Seiman, SD Dragan, DG Gaita, MBV Berceanu-Vaduva, MDV Velimirovici, SM Mateas
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:** 75 patients with valve replacement: 46 (63.1%) men, 27 (36.9%) women, mean age: 58±7 years. We considered 2 groups: group A: 38 patients with exercise training programme; group B: 37 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 depression, 8-10 mild 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±2.1 at baseline (<0.01%); group B: 6.7±1.3 after phase II vs. 13.1±1.6 at baseline (<0.05%). Depression score was improved more evident in group A: 5.2±1.6 after phase II vs. 12.1±4.4 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.
While a healthy sexual life is regarded as an important aspect of quality of life, Seventy one patients with ischemic heart disease with ejection fraction EF >40% and group with EF<40% before and after twelve weeks lasting exercise training. Results: Seventy one patients with ischemic heart disease with ejection fraction EF >40% (EF mean value 53±7%) and those who had abnormal response in the 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 responses.

**Methods**

Results: We did not observe significant changes: SAQ1 (83±10) and 8.10 years, 68% male, current diagnosis: 97%); body mass index BMI 28±4 kg.m-2; mean age 66±8 years were examined. Symptom-limited uniormergency 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 reduced load symptom-limited (WmaxSL, W, WmaxSL.kg-1, WmaxSL.kg-1.kg, WAmaxSL) 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. 1.4±0.4, p<0.01) WmaxSL (179.7±42.2 v. 162±244, p<0.05), VO2SL.kg-1 (20.4±4.9 v. 21.3±5.3, p<0.05), SAQ1 (78.6±18 v. 84.2±22, p<0.01) SAQ2 (76±22 v. 83±16, p<0.05), SAQ3 (90±15 v. 93.8±8, p<0.01), SAQ4 (88±15 v. 94±8, p<0.01), SAQ5 (85±6 v. 74±16, p<0.05). In the group with EF <40% we have found WmaxSL (97.2±22.7 v. 112.2±30.0, VO2SL, 151±30 v. 171±416, p<0.05), VO2SL.kg-1 (17.9±4.9 v. 20.7±16.6, p<0.05). The values of SAQ have not been changed significantly: SAQ1(83.1±16 v. 86±14, SAQ2(85±17 v. 88±14), SAQ3(87±12 v. 91±30), SAQ4(87±18 v. 90±18), 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 35±7% it was not changed.

**Topic:** Cardiovascular rehabilitation

**Purpose:** 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%).

**Methods:** Seventy one patients with ischemic heart disease with ejection fraction EF>40% (EF mean value 53±7%) and those who had abnormal response in the 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 responses.

**Results:** We did not observe significant changes: SAQ1 (83±10) and 8.10 years, 68% male, current diagnosis: 97%); body mass index BMI 28±4 kg.m-2; mean age 66±8 years were examined. Symptom-limited uniormergency 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 reduced load symptom-limited (WmaxSL, W, WmaxSL.kg-1, WmaxSL.kg-1.kg, WAmaxSL) 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. 1.4±0.4, p<0.01) WmaxSL (179.7±42.2 v. 162±244, p<0.05), VO2SL.kg-1 (20.4±4.9 v. 21.3±5.3, p<0.05), SAQ1 (78.6±18 v. 84.2±22, p<0.01) SAQ2 (76±22 v. 83±16, p<0.05), SAQ3 (90±15 v. 93.8±8, p<0.01), SAQ4 (88±15 v. 94±8, p<0.01), SAQ5 (85±6 v. 74±16, p<0.05). In the group with EF <40% we have found WmaxSL (97.2±22.7 v. 112.2±30.0, VO2SL, 151±30 v. 171±416, p<0.05), VO2SL.kg-1 (17.9±4.9 v. 20.7±16.6, p<0.05). The values of SAQ have not been changed significantly: SAQ1(83.1±16 v. 86±14, SAQ2(85±17 v. 88±14), SAQ3(87±12 v. 91±30), SAQ4(87±18 v. 90±18), 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 35±7% it was not changed.
Abstracts

P391
Cardiovascular safety of 1-year escitalopram therapy in clinically nondepressed patients with acute coronary syndrome: results from the DECARD trial
J A Hanash, H H Hansen, J F Hansen, O W Nielsen, A Rasmussen, M Birket-Smith
Rapide Access Chest Pain Clinic in the Copenhagen, University Hospital, Copenhagen, Denmark

Topic: Psychosocial factors and stress

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 (DEPresion 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 monitoring, rest ECG and echocardiographic assessment were obtained.

Results: Escitalopram and placebo-groups were comparable at baseline regarding age, gender, sociodemography, depression score, risk factor profile, severity of heart disease and medications. Dropout rates defined as withdrawn for any reason or lost to follow-up during the 12-month study period were 27.2% in the escitalopram group and 23.4% in the placebo group (N=NS). There were no statistically significant differences between intervention groups in any of CV safety measures including the incidence of ventricular arrhythmias 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 (NCP) attending the Rapid Access Chest Pain Clinic (RACPC) in a single tertiary centre
J H A J De Sutter, N Van De Veire, J Philippe, M De Buyzere
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 NCP and their 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 were 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. 10% had angiography done (n=17). 25 patients (15%) had other cardiac risk factors including hypertension (17%), diabetes (5%) and hypercholesterolemia (34%). 20 patients (12%) had non cardiac 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 patients. 6% 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 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.

Conclusion: A diagnosis of NCP fails 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.
Patients with a lack of introspective insight showed a tendency for lower HRV across several cardiovascular disease indices. A lifestyle intervention in primary care improves several dimensions of QOL and disease severity (multi-vessel disease and anterior infarction), significance was retained for the benefits of the intervention. Cats have lower HRV compared to dogs, a result of being able to reflect upon these phenomena. It is hypothesized to lead to more 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 any intervention program it is essential to incorporate the patient's subjective 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.

**Results:**

- 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.
- In an epidemiological survey on symptoms of sleep apnea (Kardinal Sleep Apnea Project) 1351 persons were invited to a clinical study, out of whom 535 (39%) were included. Both men and women with type D personality had lower HRV compared to non-type D subjects.

**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)

<table>
<thead>
<tr>
<th>Type of Risk Factor</th>
<th>Non-type D</th>
<th>Type D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>49%</td>
<td>59%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>30%</td>
<td>21%</td>
</tr>
<tr>
<td>Obesity</td>
<td>75%</td>
<td>83%</td>
</tr>
<tr>
<td>Hyperlipidaemia</td>
<td>93%</td>
<td>90%</td>
</tr>
<tr>
<td>Smoking</td>
<td>21%</td>
<td>6%</td>
</tr>
<tr>
<td>Physical activity</td>
<td>50%</td>
<td>30%</td>
</tr>
</tbody>
</table>

**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).
- All obese persons, both men and women, were older compared to not obese persons.
- There was observed the significant association between obesity and depressive symptoms in relation to standard care.

**Conclusions:**

- Type D personality may be associated with clustering of cardiovascular risk factors in subjects without established cardiovascular disease.

---

**P364 Mind your mind: lack of introspective insight predicts lower heart rate variability in post-myocardial infarction patients**

- **Purpose:** Introspective insight is a key concept in psychology and is associated with better physical and mental health outcomes.
- **Methods:** This study included 82 post-MI patients (82% men, mean age 56 ±10 years). All patients completed the Lack of Psychological Mindfulness scale (Demolin & Nyklícek, 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 (F1: 0.22-0.40). Non-significant 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 SD1NN and SDANN (F1: 0.70-0.90).

**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.

---

**P365 Prevalence of depressive symptoms and low social support level in Polish obese persons. Results of WOBASZ Study**

- **Purpose:** Negative psychosocial risk factors can be both risk factors of obesity due to their effect on person's behavior 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 - 3692 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 questionnaire), physical examination and laboratory tests. Depressive symptoms were assessed using Beck’s depressive scale and social support using Rosenberg and Syme questionnaires.

**Results:**

- 1313 men (21%) and 1612 women (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 social support was observed in 58% of obese men and in 79% obese women (In comparison to 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 46% (OR=1.46, p<0.0001). In obese man 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 person.

**Conclusions:**

- In obese persons, both men and women, depressive symptoms were more observed more often in persons without obesity, but low social support were observed more often only in obese women.

---

**P366 Lifestyle intervention, quality of life and cost-effectiveness, a randomized controlled trial**

- **Purpose:** To evaluate the impact of a lifestyle intervention on quality of life (QOL) and cost-effectiveness of a lifestyle intervention in patients with diabetes and other cardiovascular risk factors.
- **Methods:** A total of 151 middle-aged men and women were 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 years. Participants were followed-up at 1, 12, 24 and 36 months. Outcomes were obtained from QOL measures with the use of EuroQol and SF36-Form Short Health Survey (SF-36, and SF-4D), and life style and change in motivational stage for physical activity. A cost-utility analysis was performed, the results, gained quality-adjusted life years (QALY) and savings in health care and were considered. Probability of cost-effectiveness was also described with the use of Cost-effectiveness acceptability curves.

**Results:**

- Life style 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-4D (p < 0.01) over the 3-year period and at time point 36. Standardized response mean (SRM) showed a moderate effect. No significant improvement was seen in EQ-5D or in SF-36 mental dimensions after 3-4 years 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 471 £/person. Cost per gained QALY, savings not counted, were 1668-4813 £/person. Probabilities of cost-effectiveness were 89-100% when 50 000 £ was used as threshold of willingness to pay for a gained QALY.

**Conclusions:**

- 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.
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 peak torque (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±32m; ET group: 96±23 m) with significant intergroups differences (p 0.04). 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.

Abstracts S87
Mean BP responses to maximal exertion in different classes of sports

<table>
<thead>
<tr>
<th>Class</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low static</td>
<td>19BP</td>
<td>12BP</td>
</tr>
<tr>
<td>Moderate static</td>
<td>22BP</td>
<td>13BP</td>
</tr>
<tr>
<td>High static</td>
<td>23BP</td>
<td>14BP</td>
</tr>
</tbody>
</table>

BP — blood pressure in mmHg.
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 Smolko-Bak, R Dabrowski, B Kazimierczka, I Kowtalik, H Sewed
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 (qpld) and psychic condition. The aim of the study was to comprehensively evaluate 1-year beta-blocker therapy in patients with different forms of AF.

Material and methods: The study group consisted of 93 patients, aged 40–86 years. There were 42 pts with paroxysmal AF (PAF); age 62 ± 9 years, 29 pts with persistent, (PeAF) age 65 ± 11 years and 20 pts with chronic (CHAF) age 64 ± 7 years. 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); v 1 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 testing 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 PAF had the longest distance in 6-MWT, but patients with PeAF 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 activities (33% vs 22%), home activities (39% vs 39%) and sexual activity (30% vs 40%), least of all social activities (15% vs 9%) and family life (15% vs 9%).

Conclusions: 1-year beta-blocker therapy significantly improves exercise tolerance, but does not influence the depression symptoms 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

<table>
<thead>
<tr>
<th>V0</th>
<th>V1</th>
<th>V0</th>
<th>V1</th>
<th>HR rest</th>
<th>HR max</th>
<th>Distance</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>V0</td>
<td>V1</td>
<td>V0</td>
<td>V1</td>
<td>HR rest</td>
<td>HR max</td>
<td>Distance</td>
<td>Back</td>
</tr>
<tr>
<td>PAF</td>
<td>PeAF</td>
<td>CHAF</td>
<td>PeAF</td>
<td>CHAF</td>
<td>PeAF</td>
<td>CHAF</td>
<td>PeAF</td>
</tr>
<tr>
<td>68 ± 8</td>
<td>67 ± 7</td>
<td>70 ± 8</td>
<td>70 ± 9</td>
<td>72 ± 10**</td>
<td>76 ± 10**</td>
<td>587 ± 105*</td>
<td>587 ± 105*</td>
</tr>
</tbody>
</table>

*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 Dicklora, J Szczur Lucz, S Maazic
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 purgative mechanism that underlies exercise intolerance in HF. Left ventricle (LV) filling pressure assessed 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.

Results: In LV systolic (LVSD) and diastolic abnormalities presented by Doppler echocardiography with similar patterns can be actually the result of different forms of heart disease.

Conclusions: LVSD and LVDD profiles can be used to assess value of CPET profiles in stratifying patients with different etiology but similar degree of LVDD.

P402
Development of a regression equation to determine the best six minute walk distance (6MWD) in a cardiac rehabilitation (CR) population
J M JenniePatrick, H McBurney
1Galashiel Hospital, Melbourne, Australia, 2La Trobe 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 x 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 (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 64.3 ± 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 2 = 0.977, Group 2 R 2 = 0.948, Group 3 R 2 = 0.963) 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 x 6MWD1) – (0.438 x 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.

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

Group 1 R 2 = 0.978
Group 2 R 2 = 0.948
Group 3 R 2 = 0.963

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

Conclusions: This suggests 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 x 6MWD1) – (0.438 x age in years) + 49.34 can be used to reliably predict the second 6MWD from one 6MWT, in the CR population.

Table 1

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean difference (meter)</th>
<th>95% confidence interval for difference</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.75</td>
<td>–4.29 to 4.44</td>
<td>0.034</td>
</tr>
<tr>
<td>2</td>
<td>0.245</td>
<td>–3.94 to 4.44</td>
<td>0.873</td>
</tr>
<tr>
<td>3</td>
<td>–3.232</td>
<td>–8.93 to 2.35</td>
<td>0.009</td>
</tr>
</tbody>
</table>

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

P403
Tropinon T elevation after endurance exercise is related to running experience independent of run time and total number of heart beats
P Aaugard, M Ställberg, 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.

Method: 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; 16–47 yrs) and 18 experienced runners (defined as ≥10 previous events; 15–66 yrs; 40.8 ± 6 yrs). 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 vs. 23.8 ± 2.6 kg/m2; p = 0.04), they were slower (race duration 207.2 ± 28 vs. 174.2 ± 29 min; p = 0.01) and released more troponin (median 0.03 [IQR 0.015–0.06] vs. 0.01 [0.01–0.02]; p = 0.01). The total number of heart beats differed between groups (325,462 ± 252,1 vs. 277,804 ± 467 beating; p = 0.01). When adjusting for these differences in multiple regression, a significant association between troponin T elevation and post-race troponin T 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.
In total forty-two patients with Ebstein’s anomaly 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 (1/2Rec) of VO2, (2)Recovery of oxygen pulse (O2P). 3) Total time recovery of VO2 (TRec VO2), until RDR 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

<table>
<thead>
<tr>
<th>Group</th>
<th>AN (n=17)</th>
<th>B (n=26)</th>
<th>AN-V vs B (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.1±1.4 vs 21.9±1.4</td>
<td>p=0.001</td>
<td>22.9±0.3</td>
<td>p=0.001</td>
</tr>
<tr>
<td>43.0±1.4 vs 28.0±1.4</td>
<td>p=0.001</td>
<td>29.0±1.4</td>
<td>p=0.001</td>
</tr>
<tr>
<td>25.0±1.4 vs 18.0±1.4</td>
<td>p=0.001</td>
<td>19.0±1.4</td>
<td>p=0.001</td>
</tr>
<tr>
<td>64.0±1.4 vs 55.0±1.4</td>
<td>p=0.001</td>
<td>56.0±1.4</td>
<td>p=0.001</td>
</tr>
<tr>
<td>12.0±1.4 vs 5.0±1.4</td>
<td>p=0.001</td>
<td>6.0±1.4</td>
<td>p=0.001</td>
</tr>
</tbody>
</table>

**P values:** Significant: *p < 0.05 vs. B; vs Borderline: *p ≤ 0.05 vs B, vs; and vs N. Not Significant: *p > 0.05 vs. B, vs; and vs N.

---

**P404**

**Are recovery VO2 indices necessary for additional evaluation of ischemic cardiomyopathy exercise test?**

E. Klammann, A. Varmolovsky, R. Vishnitzer, I. Rosenzweig, G. Fink, Gefen Cardiothoracic Center, Givatayim, Israel, Pulmonary Institute, Kaplan MC, Exercise Physiology U., Rehovot, Israel

**Topic:** Exercise physiology, testing and training

**Objective:** 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 (1V3D); C:11 pts with 2V3D; D:8 pts with 3V3D. 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 (1/2Rec) of VO2, (2)Recovery of oxygen pulse (O2P). 3) Total time recovery of VO2 (TRec VO2), until RDR 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.

---

**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 (CPET) after surgical intervention. In 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. 22.5%, p=0.001). The presence of cardiac risk factors doesn’t seem to play a significant role. Patients with chronic heart failure had the greatest improvement in the redo test after surgical intervention.

**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.
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

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

Methods: 120 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 lipoprotein (ox-LDL), 3-nitrotyrosine (3-NIT) and secretory phospholipase A2 type IIA (sPLA2-A2) activity. Antioxidant protection system was estimated by glutathione peroxidase (GPO), extracellular superoxide dismutase (EC-SOD) activity and the level of protein thioldisulfide (SH) groups. The postoperative myocardial ischemia was determined by means of electrocardiography monitoring (Holter). Patients were divided into two groups: group A - 62 patients received atorvastatin 60 mg per day during 10-15 days before operation, group B - 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 inactivity of GPO (24%, p<0.05), EC-SOD (22%, p<0.05), level of protein thioldisulfide (SH) groups and decrease in level of 3-NIT (27%, p<0.05), ox-LDL - 24%, p<0.05), sPLA2-A2 IA - 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. A positive correlation was found between oxidative stress level and Hcy (p<0.05). We also found in patients with higher level of malondialdehyde and proteins peroxidation level of Hcy (p<0.05). The increase of sPLA2-A2 activity was accompanied by increase of Hcy (p<0.05).

Conclusion: Preoperational 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
Combinated effect of genetic factors, vitamin status and renal function on plasma homocysteine level in Russian patients with stable CAD
OO OlgaShalkhmatova, AL Komarov, DW Rebrakov, I Kofady, TI Kotkina, AV Bolbacheva, EP Punchnikov
Russian Cardiology Research & Production Center, Moscow, Russian Federation

Topic: Genetic-environmental interactions

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

Methods: 506 pts (388 male, age 59 ± 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 (GFR, Cockcroft-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 ng/ml (135.8 ± 38.5 pg/ml) pts had hyperhomocysteinemia. Hcy (Hcy=150 pg/ml). The frequency of polymorphisms was as follows: (hetero/homozygote): MTHFR 677T/T 43.38%, 677T/C 56.62%, 677C/C 0%, MTR 1296C/C 41.12%, 1296C/T 58.88%, 1296T/T 0%, MTRR 667G/G 8.29%, 667G/C 81.71%, 667C/C 0%. Prevalence of other factors of interest was low folat plasma level (7.2 µg/ml) - 9.7%, low B12 plasma level (<200 pg/ml) - 19%, CrCl < 15 ml/min - 58.3%, cotaining G374D and/or N340D - 28.8%.

According to univariate analysis, Hcy was related to folat plasma level (Spearmann rank, r=0.01, p<0.0001), B12 plasma level (Spearmann rank, r=-0.24, p<0.001) and renal dysfunction (Hcy level: 15.2µmol/l for GCI < 90 ml/min vs 13.5µmol/l for GCI ≥ 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 = -3.72, p<0.0001) and MTRR 667G genotype (beta 10.71, p<0.0005) were the only three independent predictors of hyperhomocysteinemia. Also Hcy level was related to some combined conditions: MTR 667G mutation + folat plasma level (beta 1.12, p<0.0001); MTRR 667G genotype + cobalamin plasma level (beta 0.001, p<0.0001); TCN 774G mutation + cobalamin plasma level (beta -0.01, p<0.0001); TCN 774G mutation + folat plasma level (beta 0.38, p<0.0001). MTR 2756G mutation + cobalamin plasma level (beta 0.004, p<0.002), MTR 2756G mutation + cobalamin plasma level (beta 0.08, p<0.001) and TCN 774G mutation + cobalamin plasma level (beta 0.07, p<0.001) were not significant. In Russian pts with stable CAD Hcy level is related to vitamin plasma concentrations, MTRB866A genotype and MTR 2756G, MTR 667G, TCN 774G 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 Crenenbroeck, V Hoymans, P Beckers, N Possemiers, C Vrints, V Conraads
Antwerp University Hospital, Edegem, Belgium

Topic: Exercise physiology, testing and training

Objectives: To characterize the paracrine activity of circulating angiogenic cells (CAC) in patients with chronic heart failure (CHF).

Methods: 20 sedentary CHF patients (NYHA II, EP Panchenko) were included in the study. The paracrine activity of CAC was characterized by the cytokines secreted in vitro in response to different stimuli. The cytokines were secreted in conditioned media and assayed for VEGF using ELISA.

Results: We observed a significant increase in paracrine activity of CAC in response to different stimuli. The most potent stimulus to improve CAC paracrine function in these patients was acute exercise.

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

P408
Coronary heart disease with depression and studies of serum interleukin-6 level
G Maimaitiming
First Affiliated Hospital of Xining Medical University, Xunyang, 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 20(11.11%), 57.78% of male patients had depression, and 57.78% 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 [MP35.77, P05] were 0.040±0.01 (0.08±0.08) ng/ml, B group were 0.020±0.01 (0.03±0.04) ng/ml, group A were significantly higher than the B group (P<0.05). In the group A, the levels of serum IL-6 in patients with moderate and severe depression were [0.050±0.02 (0.09±0.05)] ng/ml higher than in patients with mild depression [0.040±0.01 (0.05±0.03)] 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 irrevocably role in coronary heart disease with depression. Key words: Coronary heart disease, Depression; IL-6.
Comparison of predicted dose vs. actual dose using pharmacogenomic algorithms in 483 patients on long term warfarin therapy

B Diug1, L Sheffield1, M Dooley1, J Lowthian1, S Evans1, E Maxwell4, A Street3, J Mcneil1
1Monash 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.