Prevention and epidemiology
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Effects of variation in weight on long-term changes in blood pressure. The SHIP cohort study.
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Topic: Obesity (Prevention & Epidemiology)

Background: The mechanisms underlying the observed relation between changes in weight and its influence in blood pressure and events are not fully understood.

Methods: We examined 3300 subjects from a population-based survey at baseline in 1997/2001 and at follow-up in 2002/2006 with information on blood pressure (BP) levels and weight (measured in both examinations 5 years apart). We analyzed the relation between relative and absolute weight changes and their associations with relative and absolute changes in blood pressure and the relative risk (for a 5% decrease in relative weight compared with the individuals that have kept their initial weight) for incident hypertension (>140 mmHg systolic or ≥90 mmHg diastolic BP or use of antihypertensive medication) in the individuals that were, at the baseline study, normotensive; for normalization of blood pressure, in the individuals that were, at the baseline study, hypertensive and for development of incident cardiovascular events (myocardial infarction or stroke)) using linear and Poisson regression (adjusted for sex, age, height, the baseline value of body weight and systolic blood pressure and the baseline and their relative changes over the 5-year of heart rate and the use of antihypertensive medication) models.

Results: The relative change of 1% in weight was associated with a relative change of 0.24% (0.19% to 0.29%) in systolic, 0.26% (0.21% to 0.31%) in diastolic and 0.23% (0.20% to 0.30%) in mean arterial blood pressure and 0.20% (0.10% to 0.31%) in pulse pressure. The absolute change of 1 kg in weight was associated with an absolute change of 0.39 mmHg (0.30 mmHg to 0.49 mmHg) in systolic, 0.26 mmHg (0.20 mmHg to 0.31 mmHg) in diastolic and 0.30 mmHg (0.24 mmHg to 0.36 mmHg) in mean arterial blood pressure and 0.13 mmHg (0.06 mmHg to 0.20 mmHg) in pulse pressure. With respect to the relative risks, there was a clear and significant protective effect of a 5% decrease in relative weight compared with the individuals that have kept their initial weight. The relative risk for incident hypertension was 0.87 (0.81 to 0.93), for normalization of previous hypertension it was 1.17 (1.08 to 1.26) and for development of incident cardiovascular events it was 0.80 (0.66 to 0.97).

Conclusions: After 5 years of follow-up, the individuals who lost at least 5% of their initial weight have greater chance to control their blood pressure levels without medication and to have fewer cardiovascular events.

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Treatment and control of dyslipidemia in hypertension in a random population sample of the Czech Republic over the past 10 years
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Topic: Hypertension (Prevention & Epidemiology)

Hypertension and dyslipidemia are the most prevalent cardiovascular diseases in the population and major risk factors for a variety of serious conditions also contributing substantially to cardiovascular mortality.

The aim of the study was to determine changes in the treatment and control of hypertension and dyslipidemia in a randomly selected population sample of the Czech Republic over the past 10 years.

Method: Three independent cross-sectional surveys were performed in 1997-1998, 2000-2001, and 2006-2009 in nine districts of the Czech Republic (total number of individuals 5,209, 3,325, and 3,612, respectively), always involving a 1% randomly selected population sample aged 25-64 years. This analysis is related to 512, 623, and 883 drug-treated hypertensives, respectively.

Results: Prevalence of hypertension increased over the past decade (33.4% vs. 36.6% vs. 40.5%; p trend < 0.001) as did the proportion of drug-treated hypertensive individuals (47.8% vs. 51.3% vs. 60.4%; p trend < 0.001). The number of statin-treated hypertensive individuals increased as well (2.6% vs. 5.6% vs. 25.0% of males; p trend < 0.001, and 1.4% vs. 2.1% vs. 22.1% of females; p trend < 0.001). Well-controlled dyslipidemia (LDL cholesterol level ≤ 3 mmol/l) was achieved in 22.1% vs. 13.5% vs. 47.2% of males (p trend < 0.001), and 25.2% vs. 11.2% vs. 40.1% of females (p trend < 0.001). There was an increase in the average number of antihypertensive drugs used by males (1.55 ± 0.70 vs. 1.86 ± 0.92 vs. 2.01 ± 1.02; p < 0.001) whereas this was unchanged in females.

Conclusion: While the prevalence of hypertension in a random population sample of the Czech Republic rose over the period from 1997-98 to 2006-09, treatment and control of hypertension and dyslipidaemia improved.

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Various definitions of parental history of myocardial infarction and cardiovascular risk in the Dutch MORGEN-cohort
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Topic: Other risk factors (Prevention & Epidemiology)

Purpose: A parental history of myocardial infarction (MI) is an independent risk factor for cardiovascular diseases (CVD). However, definitions of this risk factor differ and the vast majority of studies has been conducted in men only. The purpose of the present study was to evaluate the relationship between parental history of MI and CVD incidence, in particular the impact of gender and age of onset of MI.

Methods: Baseline data were collected between 1993 and 1997 in 18,524 persons aged 40 – 65 years in a Dutch prospective cohort study with 10-year follow up. CVD events were obtained through linkage with the National Hospital Discharge Register and Statistics Netherlands for causes of death. We calculated the hazard ratio (HR) and 95% confidence intervals (CI) for CVD incidence for persons with a parental history of MI and adjusted for lifestyle (i.e. smoking), BMI, education and biological risk factors.

Results: During follow-up 600 men and 1,444 women experienced a CVD event. Of all respondents, 36% had a parental history of MI, with a mean age of MI of 63 years in fathers and 67 years in mothers. Associations between parental history and CVD incidence did not differ significantly between men and women. The pooled age and gender adjusted HR was 1.3 (95% CI 1.1-1.5) for those with a paternal MI, 1.5 (1.2-1.8) for those with a maternal MI and 1.6 (1.2-2.2) for those with both parents with MI. With decreasing parental age of onset of MI, the HR increased from 1.2 (1.0-1.6) for age ≥ 70 y, to 1.4 (1.1-1.7) for age 60-70 and 1.5 (1.2-1.8) for age < 60 years for paternal MI and from 1.1 (0.9-1.5) to 1.8 (1.3-2.5) and 2.2 (1.6-3.0), respectively, for maternal MI. Adjustment for lifestyle and biological risk factors for CVD did not influence the HRs of those with a paternal history of MI and only slightly lowered the HRs in those with a maternal history of MI.

Conclusion: Persons with a parental history of MI have an increased CVD risk, which is of similar magnitude in men and women. Risk is increasing with decreasing parental age of MI, especially when the mother is affected. Consequently, a maternal history of MI < age 70 was the strongest predictor of CVD risk.

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The extent of the physical inactivity problem in Acute Coronary Syndrome patients and some clinical and demographic factors that influence it
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Topic: Other risk factors (Prevention & Epidemiology)

Introduction and Purpose: Significant improvements have been made over the last 20 years in the reduction of many cardiovascular risk factors and this has consequently led to a significant reduction in cardiovascular related morbidity and mortality. However with regard the lifestyle factors: obesity and physical activity, the opposite trend has occurred which may have been a harbinger of a downward trend in mortality and morbidity in the future. The aim of this study was to describe the physical activity of Acute Coronary Syndrome (ACS) patients prior to an acute event and some of the factors that influence this. The National Guidelines on Physical Activity for Ireland and Europe recommend at least 30 minutes a day of moderate activity 5 days a week.

Methodology: Patients with ACS who were admitted to 1 or 5 hospitals were recruited to the study. Patients were excluded from the study if they had not participated in their normal physical activity regime in the week prior to admission. Physical activity was assessed using the short form International Physical activity questionnaire (IPAQ), patient demographics were acquired through patient interview and patient notes. Multiple regression analysis was used to examine the influence of gender, education level, employment status, past cardiac history, presence of risk factors including diabetes, on physical activity in METs (metabolic equivalents). Data were analysed using SPSS version 18 and level of significance was set at 0.05.

Results: The sample of 1401 patients profile was: 29% female; mean BMI 27; current diagnosis: unstable angina 35%, STEMI 26%, NSTEMI 33%, mean age 63.47. A total of 47% of ACS patients’ participation in physical activity was below European guidelines. After controlling for age the regression model had a small but significant influence on the variance in physical activity (F (3, 1373) = 3.913, p<0.001). Physical activity was significantly influenced by: gender, education level, smoking status, presence of hypercholesterolemia or diagnosis of hypertension. While it was not influenced by: past cardiac history, diabetes, BMI or employment status.

Conclusion: Large proportions of the at risk population do not participate in physical activity at the recommended levels. Certain demographic and clinical characteristics influence patient physical activity. Awareness in practice of factors that are related with poor adherence to recommended activity levels may also assist in targeting appropriate interventions to enhance activity.
Disturbed adiponectin AMPK system in skeletal muscle of metabolic syndrome patients

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Topic: Obesity (Prevention & Epidemiology)

Background: Insulin resistance (IR) is a main characteristic of patients (pts) with the metabolic syndrome (MS). Adiponectin (APN) is an insulin-sensitizing adipocytokine. Through binding on its main skeletal muscle receptor, AdipoR1, APN activates AMPK-activated protein kinase (AMPK), a key player in energy homeostasis. We aimed to investigate the interaction between circulating APN and insulin and the mRNA expression of AMPK and AdipoR1 in skeletal muscle of MS pts.

Methods: 14 MS pts and 7 healthy subjects underwent clinical assessment. Blood samples were taken to determine IR (HOMA model) and circulating APN, lipoproteins and inflammatory parameters. Muscle biopsies (m. vastus lateralis) were obtained to assess mRNA expression of both AMPK subunits (AMPKα1 and AMPKα2) and both AdipoR1 subunits (AMPKα1 and AMPKα2).

Results: Compared to healthy subjects, MS pts exhibited higher HOMA-IR and C-reactive protein (P=0.05). Circulating APN tended to be lower (P=0.122). At the skeletal muscle, the mRNA expression of both AMPKα1 and AMPKα2 subunits in MS pts was lower compared to healthy subjects (P=0.030; P=0.044, respectively), whereas the expression of AdipoR1 was upregulated (P=0.012). A positive correlation was demonstrated between AMPKα1 and AdipoR1 in both the healthy (r=0.964; P<0.001) and the MS pts (r=0.600; P=0.023), but in the MS pts a shift upwards occurred indicating an increased AdipoR1 expression for a similar AMPKα1 expression, compared to controls (Figure).

Conclusion: Previously, resistance to APN and/or a blunted stimulatory effect of APN on AMPK activation have been shown in MS pts. The present data suggest for the first time, that at the level of the skeletal muscle, the disturbed interaction of APN with AMPK is located downstream the AdipoR1 receptor.

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Preliminary analyses for the updating of the Italian CUORE Project cardiovascular risk charts

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Topic: Prevention and rehabilitation from knowledge to practice

Background: International guidelines for cardiovascular diseases (CVD) prevention recognized risk charts as main tool for identification of high risk individuals and for supporting the reduction of modifiable risk factors. In 2003 the CUORE Project, a prospective population-based study, published the Italian risk charts now introduced in clinical practice for the risk assessment of the healthy general population. The inclusion of a new cohort (Osservatorio Epidemiologico Cardiovascolare) and the continuous follow-up (until December 2004) have lead to a preliminary analysis for the update of the Italian CVD risk charts.

Methods: Analyses considered 10,233 men and 15,895 women aged 35-74 years from cohorts in North, Centre and South of Italy with 10 years median time of follow-up for validated fatal and nonfatal coronary and cerebrovascular events. In all cohort a risk models were created using standardized procedures. Multivariate Cox regression models were implemented and the area under the receiver operating characteristic (ROC) curve was calculated for each model. For continuous variables, hazard ratios (HR) were reported with level 1 standard deviation higher and for dichotomized variables, yes vs no.

Results: All risk factors included in the previous risk chart (age, sex, systolic blood pressure, total and LDL cholesterol, smoking status, hypertension treatment and diabetes) were considered as risk factors. The median follow-up time of the entire cohort was 5.9 years.

Conclusions: Set of variables included in the previous risk chart was confirmed in both men and women. Further analyses are needed to study the reliability of risk charts based on age-specific risk models and the inclusion of fasting plasma glucose as continuous variable instead of diabetes.
Background: Hyperuricemia has been linked to cardiovascular disease possibly through the generation of reactive oxygen species and subsequent endothelial dysfunction.

Methods: 99 subjects (62 men, mean age 43.16 ± 6.74 years), all non-smokers without any known cardiovascular disease were studied. Subjects were divided in two groups: high uric acid (UA) ≥ 5 mg/dl (n=50) and low UA < 5 mg/dl (n=49). All subjects were on no medication. Endothelial function and atherosclerosis were evaluated in all subjects. Endothelium-dependent dilation was assessed by measuring flow mediated dilation (FMD) of the brachial artery and endothelium independent dilation was assessed by measuring changes in brachial artery diameter in response to sublingual nitrate administration. CIMT is a well-established index of atherosclerosis.

Results: There were no significant differences between groups regarding: blood pressure, body mass index, glucose and lipids levels. FMD was markedly lower in subjects with high UA -5.62 ± 1.57% vs 7.45 ± 1.16% in subjects with low UA (p<0.0001). Nitrate induced dilation was 10.93 ± 1.52% in subjects with high UA vs 11.04 ±1.6% in subjects with low UA (p=NS). CIMT was significantly lower -0.95 ±0.82 mm in subjects with low UA vs 1.31 ±0.14 mm in subjects with high UA (p<0.01). There was a significant inverse correlation between UA and FMD (r = -0.64, p<0.0001) and a significant direct correlation between UA and CIMT (r = 0.23, p=0.02). Nitrate induced dilation did not correlate with UA (r = -0.13, p=NS).

Conclusions: An increased serum uric acid concentration is a risk factor for increased carotid IMT and reduced FMD in subjects without cardiovascular disease. The elevated serum uric acid, per se, may constitute a novel risk factor for endothelial dysfunction and may be considered predictor of atherosclerosis in healthy subjects.