Summaries of Articles

Clinical Investigations

Total Cholesterol/HDL-cholesterol Ratio Best Lipid Predictor of Coronary Disease in Turkish Adults: Mean Triglyceride Levels Rise by 1 mg/dl Per Year

A. Onat, B. Yıldırım, B. Erer, Ö. Başar, A. Çetinkaya, K. Ceyhan, Ö. Uysal, İ. Keleş, V. Sansoy

In a 10-year follow-up of the original cohort of the Turkish Adult Risk Factor Study, plasma lipids were determined by the enzymatic method with a Reflotron apparatus in 1862 subjects (mean age 50.6 ±14), and trends were studied after stratifying for sex and age groups. In addition, serum lipoproteins and apolipoproteins AI and B were determined in 2416 participants comprising the original and new cohorts, the latter by (Behring) turbidimetry. Random plasma samples were validated in a reference laboratory. After age-standardization, mean concentrations of total cholesterol (TC) were not significantly changed in the 1990s whereas those of triglyceride rose by 4 and 12.8 mg/dl in men and women, respectively. The presence of high ratios of apo B/apo AI (0.92 and 0.82) in men and women represented an adverse setting of coronary risk. Data of the survey allowed to estimate the presence of 800.000 Turks in whom lipid-lowering drugs were being administered - mostly not in secondary but primary prevention.

Strong correlations were noted in univariate analysis between triglycerides and apo B and (inversely) HDL-cholesterol levels in both genders. Among the apparently healthy population at baseline, TC/HDL-C ratio proved to be the only significant independent predictor of future fatal and nonfatal coronary heart disease, in a logistic regression model comprising 11 risk parameters. Relative risk of 1.295 signified an associated 68% excess coronary risk between a ratio of - for example - 4 and 6.

In conclusion, over the past 10 years, an annual increase by 1 mg/dl in plasma triglyceride levels constituted the principal change in plasma lipids among Turks. A prospective evaluation for the prediction of fatal and nonfatal CHD, showed the TC/HDL-C ratio to be the best independent lipid marker which thus should draw special consideration in the risk assessment of Turkish adults.

Key words: Cholesterol, coronary heart disease, dyslipidemia, epidemiology, lipid lowering treatment, plasma lipids, risk factors

Blood Pressure, on Prospective Analysis the Best Predictor of Coronary Mortality in Turkish Adults, Rose by a Mean of Over 5/3 mmHg in the Past 10 Years

A. Onat, Ö. Başar, İ. Keleş, V. Sansoy, B. Erer, B. Yıldırım, A. Çetinkaya, K. Ceyhan, Ö. Uysal

In a 10-year follow-up of the cohort of the Turkish Adult Risk Factor Study, blood pressure (BP) was measured in 1895 subjects (mean age 50.6 ±14), and trends were studied after stratifying for sex and age groups. Criteria for the diagnosis of coronary heart disease (CHD) and death from CHD conformed to those previously described. When age was kept constant, overall net mean BP of the sample population rose by 4.4/2.7 mmHg in men and 6.4/4.2 mmHg in women over 10 years. The prevalence of hypertension, defined as being on antihypertensive medication, or displaying a blood pressure ≥140 and/or ≥90 mmHg, in the total cohort of 2455 participants, was 40% in men and 51.6% in women, indicating the existence of 11.5 million hypertensive Turkish adults. Forty-five % of them were estimated to be under drug treatment and that hypertension control was achieved only in 42% of them as defined by keeping BP at normal or mildly hypertensive levels.

Waist circumference again had the strongest correlation between systolic or diastolic pressure in both genders, followed by body weight. Logistic regression analysis for death from CHD at a 10-year follow-up among participants free of CHD at baseline revealed systolic BP to be significant independent predictor in both genders such that each increment of 10 mmHg was associated with 59% excess coronary mortality. For nonfatal CHD, systolic BP had an independent impact only in men and at borderline significance, and diastolic BP carried a borderline significance solely in women. A high pulse pressure or a low diastolic pressure were shown for the first time among Turks to predict coronary events, at least in men.

Key words: Antihypertensive treatment, blood

pressure, coronary heart disease, coronary mortality, epidemiology, hypertension prevalence

Follow-up of Corrected QT Interval in the Detection of Doxorubicin Cardiomyopathy: an Experimental Study

C. Barçın, M. Safalı, S. Köse, H. Kurşaklıoğlu, K. Erinç, E. Işık, E. Demirtaş

Comprehensive cardiac evaluations are recommended for all doxorubicin-treated patients to detect subclinical cardiac failure. In this study we examined the prolongation of corrected QT interval (QTc) in doxorubicin treated rabbits. Male New Zealand rabbits (n=24) were randomised into two groups. Group A (n=12) was given doxorubicin (2mg/kg once a week) and Group B (n=12) was given saline during 10 weeks. QTc intervals were measured in every two weeks from extremity leads for each animal. At the end of the study cardiac samples were examined histologically and each animal was given a histopathological score between 0 and 4 according to degree of cardiomyopathy. Histopathological scores were 3 for one rabbit and 4 for the remaining 11 rabbits in Group A and were 0 for all the rabbits in Group B. QTc intervals at the beginning and at the end of the study were 248.5±17.7 msec. and 298.8±13.7 msec. consecutively (p≅0.012) in Group A, 243.8±17.6 msec. and 245.4±17.8 msec. consecutively (p>0.05) in Group B. Prolongation of QTc was statistically significant at the end of the 4th week (262.3±17.9 msec.) when compared with the basal value in Group A (p<.05). As a result, prolongation of QTc, a measure of myocardial repolarization may reflect injury to myocardial cells and is an easy and inexpensive method that can be used in the detection of subclinical cardiomyopathy in doxorubicin treated patients.

Key words: Doxorubicin, cardiomyopathy, QT interval

Effect of Diabetes Mellitus on Coronary Collateral Vessels

Y. Nişancı, M. Sezer, B. Umman, E. Yılmaz, S. Umman

Although the pressure gradient between the normal and stenotic vascular regions is known to be most important factor for collateral vessel development, factors which are responsible for variations among patients with ischemic heart disease are not well known. Likewise, it is still not clear whether diabetes mellitus (DM) has any effect on coronary collateral development. Coronary angiography, the most commonly used technique for studying collateral circulation, may not be accurate in assessing collateral circulation because most collaterals are situated intramurally or too small to visualize angiographically. Intracoronary pressure measurement is a new technique to provide accurate and quantitative information about the collateral circulation. We therefore sought the effects of DM on coronary collateral vessels in patients with CAD by using intracoronary pressure measurement technique.

Methods: Study population consisted of 40 patients (20 diabetic) with chronic ischemic heart disease referred to angiography laboratory due to their ischemic symptoms verifed previously with at least one non-invasive test. All of the patients had single-vessel disease with more than 70% narrowing and underwent PTCA and/or stent implantation procedure for this vessel. After angiography, fiber-optic pressure monitoring guide-wire (Pressure wire-Radi) was advanced to the stenosis to be dilated. The same wire was used as guide wire for angioplasty catheter. During complete occlusion with balloon inflation, distal pressure was recorded as coronary wedge pressure (CWP). As a more valuable parameter, collateral flow index (CFI) was determined by the ratio of simultaneously measured CWP (mmHg) to aortic pressure (Pa, mmHg, obtained from the guiding catheter) (CFI: CWP/Pa).

Results: Pressure measurements were performed on 20 diabetic and 20 non-diabetic patients. The mean value of CWP was 18.1 ± 8.6 mmHg in the diabetic group and 26.8 ± 9.6 mmHg in the non-diabetic group (p<0.05). The mean value of CFI was also significantly higher in the non-diabetic group (0.17 ± 0.08 in diabetic group and 0.25 + 0.09 in non-diabetic group, p<0.05)

In conclusion, it was demonstrated that coronary collateral vessel development is impaired in diabetic patients compared with nondiabetic patients.

Key words: Diabetes Mellitus, coronary heart disease, coronary arteries, coronary collateral circulation

EuroSCORE (European System for Cardiac Operative Risk Evaluation): Is it realistic?

H. Karabulut, F. Toraman, S. Dağdelen, G. Çamur, C. Alhan

It was the purpose of our study to assess the validity of EuroSCORE in our patient population. Between March 1999 and September 2000, information on risk factors and mortality was collected for 625 consecutive adult patients undergoing heart surgery with cardiopulmonary bypass. EuroSCORE was used for risk stratification. Mean age ± standard deviation was 58.6 ± 10.8 and 28.5% of the patients were female. The incidence of common risk factors were as follows: diabetes mellitus (17.6%), hypertension (38.7%), chronic airway disease (8.2%), recent myocardial infarction (31.4%), chronic renal failure (1.7%), extracardiac arteriopathy (5.9%), reduced left ventricular ejection fraction (35.7%), previous cardiac surgery (2.7%), and non-elective operation (4.3%). Regarding epidemiology, isolated CABG accounted for 82% of adult cardiac surgery. The patients with 2 or less points were allocated to low risk group, with 3 to 5 points to moderate risk group, and with 6 or more to high risk group. Expected and observed mortality rates for each group were obtained. Expected and observed mortality rates for low (n = 253), moderate (n = 249), and high risk (n = 123) groups were, 1.2 ±0.8 vs 0; 3.9 ± 0.8 vs 0.8 ± 0.9; and 8.4 ± 3.2 vs 3.2 ± 0.2, respectively. Overall, the expected and observed mortality rates were 3.7 ± 3.1 vs 0.96±9.8. There was no overlap between the 95% cofidence intervals of observed and expected mortality in all three groups ($p<0.001$). EuroSCORE is a simple and objective system for predicting the risk of heart surgery. However, it seems that mortality is considerably overestimated by this score. The results may be interpreted more objectively with multiinstitutional studies involving larger number of patients.

Key words: Open heart surgery, EuroSCORE

Reviews

Vulnerable Atherosclerotic Plaque

G. Akgün

In the pathophysiology of acute coronary syndrome (ACS) plaque vulnerability is much more important than plaque size and stenosis severity. Plaque vulnerability is the consequence of inflammatory activity within the plaque. Rupture-prone vulnerable plaques are characterized by 1) a soft lipid core occupying at least 50% of the plaque volume, 2) a thin fibrous cap with reduced collagen content, 3) a high density of monocytes/macrophages, lymphocytes, mast cells, 4) low density of smooth muscle cells, 5) a high tissue factor content. Inflammatory cells (macrophages) produce specific metalloproteinases that degrade collagen within the fibrous cap. Macrophages and lymphocytes also secrete cytokines that are cytotoxic for smooth muscle cells and activated macrophages can also induce smooth muscle cell apotosis by direct cell contact. The result is a decrease in the number of smooth muscle cells and decreased collagen synthesis. The plaques with large soft lipid pool and a thin fibrous cap cannot resist local mechanical stresses and easily rupture with subsequent superimposed thrombosis and results in ACS.

What causes inflammation in the atherosclerotic plaque? Where does the inflammatory stimulus come from? At the present, the exact mechanism is not known; however, it is fair to state that oxidised LDL, oxidative stresses, low grade chronic infections and autoimmune responses have a role in plaque activation.

The evidence that inflammation is an essential feature of vulnerable plaque has led to intensive search for ischemic markers of plaque inflammation. High-sensitive -C reactive protein (hs CRP) has been found to have a strong correlation in the risk of a future acute cardiac event.

Key words: Vulnerable plaque, inflammation, CRP

Identification of Vulnerable Atherosclerotic Plaques

H. Kültürsay

The rupture of a vulnerable atherosclerotic plaque usually underlies acute coronary syndromes. Early identification of such a plaque is essential for the prevention from subsequent clinical events. The methods for identifying vulnerable plaques should demonstrate both the intrinsic features leading to rupture i.e. increased lipid content, thin fibrous cap and increased inflammatory activity and, systemic tendency for the plaque progression. Therefore, these methods for the detection of vulnerable plaques can be classified into two groups: 1.Locally identifying methods, 2.Systemic markers

Most of the locally identifying methods are invasive. Intravascular ultrasound and coronary angioscopy are the leading methods. Electron beam computed tomography (EBCT) which calculates the vascular calcification score, magnetic resonance imaging (MRI) techniques which help in characterization of the plaque structure and thermographic methods demonstrating the increased vascular heat production due to inflammatory activity are other promising methods.

Systemic markers which reflect the increased and ongoing inflammatory activity include C-reactive protein, serum amiloid A, interleukin 6, activated protein C resistance and seropositivity for chlamydia pneumonia.

The best approach should probably be the evaluation of the information obtained from locally identifying methods in the light of systemic markers and risk factors.

Key words: Intravascular ultrasound, coronary angioscopy, C-reaktive protein

Stabilization of Vulnerable Atherosclerotic Plaque

T. Okay

Acute coronary syndromes results mainly from rupture of a vulnerable atherosclerotic plaque. Regular exercising, quit to smoke, lipid lowering agents, angiotensin converting enzyme inhibitors have been shown to reduce the incidence of acute coronary syndromes presumably through plaque stablization. The evidence supporting plaque stablization by these agents and the mechanisms by which these agents stablize plaques are discussed in this review.

Key words: Plaque stablization, lipid lowering agents, ACE inhibitors

Case Reports

Obstructive and Nonobstructive Cor Triatriatum: Report of Two Cases

O. Küçükosmanoğlu, N. Özbarlas, S. Erdem, H. Yalnız, O. K. Salih

Cor triatriatum is characterised with a membranous diaphragm which divides the left atrium into two chambers, the proximal chamber accepts the pulmonary veins and the distal one communicates with left ventricle via mitral valve. The size of the orifice between chambers is the main determinant of physiologic abnormalities and clinical symptoms. Herein, we report two cases of cor triatriatum. The first case was a 7-year-old boy who was admitted to our hospital with failure to thrive and palpitation. Echocardiography showed obstructive type of cor triatriatum. Cardiac catheterization revealed elevated pulmonary artery and pulmonary capillary wedge pressures. The membrane was removed surgically. The second case was a 1-year-old boy with symptoms of heart failure. Echocardiography showed perimembranous VSD and a nonobstructive membranous diaphragm which divided the left atrium into two chambers. Cardiac catheterization revealed moderate left-to-right shunt and mild pulmonary hypertension. The patient underwent surgical procedure for VSD closure and even though it was not an obstructive one, the membrane of cor triatriatum was removed. Both patients are is well after operation. This report illustrates the wide symptomatology of cor triatriatum.

Key words: Cor triatriatum, echocardiography, congenital heart disease

Treatment of a Proximal Left Anterior Descending Artery Aneurysm by Stent-graft Implantation: Report of a Case with Adverse Long-term Outcome

A. Sezer, A. Öncül, E. Yılmaz, M. Meriç

Coronary stenting with stent-grafts have been reported to be a safe and quick treatment option for coronary artery aneurysms although long-term results in large patient groups are not available. We report a case of saccular aneurysm of proximal left anterior descending artery (LAD) associated with anterior myocardial infarction in the absence of any significant stenosis. The aneurysm was successfully obliterated by using a polytetrafluoroethylene-coated coronary artery stent. However, the patient presented with anterior reinfarction two months after stent implantation. Coronary angiography demonstrated sustained occlusion of the coronary aneurysm and severe focal stenosis at the proximal edge of the stent, involving the ostium of LAD. The patient underwent coronary bypass surgery, and he is still asymptomatic 3 months after the operation.

Key words: Coronary artery aneurysm, PTFE-coated stent