

Z VĚDECKÉ ČINNOSTI

THE CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS OF PATIENTS AFTER PERCUTANEOUS CORONARY ANGIOPLASTY (PTCA) WITH CORONARY STENTS IN THE CZECH REPUBLIC

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Abstract

Despite a decline in mortality over the past two decades, cardiovascular heart disease is the leading cause of death in the Czech Republic. Ischaemic heart disease (IHD) which causes more than half of these deaths is a complex disease with multifactorial etiology. Strategies for preventing and treating IHD must be multifactorial in the same way.

A study was conducted in conjunction with the European Centre for Medical Informatics, Statistics and Epidemiology – Cardio on patients affected by IHD from 2002 to 2004. A total of 54 men and 15 women, aged 40 and older, were recommended for percutaneous coronary intervention with coronary stent implantation. Clinical parameters including basic anthropometric parameters were analyzed as well as traditional risk factors like age, gender, family history, hypertension, dyslipidemia, smoking status, overweight and diabetes.

Results showed in both women and men significant association with similar trends in phenotype (13 % of the patients were of normal weight), presence of risk factors (positive family anamnesis 38 %, smoking 65 %, hypertension 61 %, diabetes mellitus 20 %, hyperlipoproteinemia 74 %, obesity 87 %) and increased risk of clinical coronary events.

These findings reinforce the importance of the known mechanism compensation for beneficial effects on the general health of the population, particularly on cardiovascular morbidity and mortality.

Key words: *ischaemic heart disease, percutaneous transluminal coronary angioplasty, epidemiology, risk factors, coronary stents, biostatistics.*

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Introduction

Results of epidemiological studies exhibit a significant decline in mortality due to cardiovascular diseases in Europe. Although acute forms of such diseases are fewer in number, chronic forms thereof are becoming more common and showing prevalence, influenced by the overall greying of the population. The decline in cardiovascular diseases has undoubtedly been brought about by the improvement in diagnostic and interventional methods and the increased accessibility of cardiovascular surgery. In spite of changes for the better in this area, cardiovascular diseases still remain the most common cause of de-

ath in the Czech Republic and continue to significantly contribute to mortality at productive age. The most frequently fatal cardiovascular disease of atherosclerotic origin is ischaemic heart disease (IHD) (Hromadová, 2004).

The concept of the risk factors and multifactorial etiology of atherosclerosis and its clinical manifestations first came into being as early as fifty years ago, based on the research findings accomplished by the legendary Framingham study (Kandel, Gordon, 1971). The conclusions of a number of studies investigating cardiovascular risks and collecting data on the risk factors of atherosclerosis and their medical treatment, show that the classic risk factors (hypertension, diabetes mellitus, hyperlipoproteinemia, smoking, obesity) are the same around the world. Although the vast majority are preventable, sufficient compensation of these risk factors is still not assured in many regions (Mensa, 2008; Tseng et al., 2008; Haddad, Mahafza, 2008).

Material and methods

The research was performed as part of the STENT project organised by the European Centre for Medical Informatics, Statistics and Epidemiology (Cardio) and the Centre of Biomedical Informatics at the Czech Academy of Sciences. A total of 69 patients diagnosed with ischaemic heart disease were examined at the 2nd Clinic of Internal Medicine at the General Faculty Hospital of the 1st Medical Faculty of Charles University in Prague from 2002 to 2004. In view of the nature and severity of the affliction, patients were referred for performance of percutaneous transluminal coronary angioplasty (PTCA). In 80 % of cases the PTCA involved implantation of 1 or possibly 2 coronary stents into the afflicted artery. Ischaemia was demonstrated in the majority of patients through manifestation of clearly defined clinical symptoms and through a stress test in less than 10 % of the patients.

The cohort was divided into groups according to sex and age. The patients were divided into two age brackets above and below the age of 55, because this is considered to be the start of high-risk age in terms of frequency of IHD occurrence, above all in women as they enter the postmenopausal period of life. This also explains the very low number of women in the younger age bracket of the cohort.

Data was collected on each patient's health risk profile, including his/her positive family anamnesis, smoking habits, hypertension, obesity, dyslipidemia and type 1 and 2 diabetes mellitus. For evaluation of obesity we used the BMI categories, classifying obesity according to the WHO (World Health Organization) and IOTF (International Obesity Task Force) criteria, including normal weight, overweight and class I, II and III obesity categories. The waist/hip ratio (WHR) was set for evaluation of the body fat distribution type, with a risk ratio of 1 and over for men and 0.85 and over for women. Another relevant parameter was waist girth with a risk threshold of 94 cm in men and 80 cm in women.

The patients' symptomatology was monitored along with the incidence of ischaemic complications such as myocardial infarction (MI) and peripheral arterial disease (PAD). Additional information was gleaned from the patient's medical records. The efficacy of PTCA and the incidence of subsequent clinical complications were also evaluated. A statistical comparison of lipid spectrum changes was performed six months post-operation. The lipidogram included the values of total cholesterol, LDL (low-density lipoprotein) and HDL (high-density lipoprotein) and triacylglycerols in mmol/l.

The incidence of these features was also tested according to sex and age group. The Chi-square test in the STATISTICA 6.0 program was used in a corresponding contingency table for testing the structural congruency hypothesis. A comparison of changes in lipidogram values was performed six months after the operation using pair-sample t-tests with verification of the normality of the distribution of the features.

Results

The cohort of 69 patients was made up of 54 males and 15 females, aged from 41 to 80. The average age in the first age bracket, up to 55 years of age, was 50.9 years, whilst in the second age bracket the average age was 64.6. There was little difference between the average ages of the male patients (59.5 years) and the female patients (60.8 years).

The initial diagnosis (Fig. 1) for 45 % of the patients was stable AP (angina pectoris), in a large number of cases evaluated with the most severe functional impairment. In the majority of the patients the required decrease was brought about after revascularisation of the area affected. Unstable angina pectoris (UAP) was found in a high proportion of the female patients in both age brackets (70 % in the first age bracket and 50 % in the second) compared with the males. Other diagnoses such as post-infarction angina pectoris (9 % of the males, 0 % of the females), MI (7 % of the males and females) or acute ischaemia (6 % of the males, 0 % of the females) were considerably less widespread. In the majority of patients stenosis was localised in the anterior interventricular artery or the right coronary artery. Only one artery was affected in 47 % of the female patients, whereas two arteries were affected in 35 % of the male patients. There was only one case of more than three arteries being affected: a male patient in the higher age bracket suffering from stenosis in five areas of the myocardium. Almost half of the male patients (42.6 %) and a fifth of the female patients (19.3 %) had suffered from MI. Some had needed PTCA surgery whilst a smaller proportion had undergone coronary artery bypass graft (CABG). Some patients reported other past cardiovascular system complications. 5.6 % of the male patients and 6.7 % of the female patients had suffered a stroke. The same percentage of patients suffered from ischaemic disease of the lower extremities. None of the above cases had occurred amongst the women in the lower age bracket up to 55 years old. Amongst the male patients the incidence of such cases was similar in the two age brackets, although slightly higher in the older age bracket.

The operations performed were evaluated very positively. Immediate post-surgical complications only arose in two patients: one case of recurrence of ischaemia which had required rePTCA and one case of nonQ myocardial infarction. Both cases had occurred in male patients, one from each of the age brackets.

The patients' convalescence and incidence of adverse reactions was monitored for a period of six months post-operation. The most commonly observed PTCA complication was restenosis. Restenosis, evaluated according to clinical manifestation, was found in 8 % of the male patients, 9.5 % of whom were from the first age bracket and 6.9 % of whom were from the second age bracket. No cases were detected amongst the female patients. After performance of a check-up angiography after six months, however, restenosis was detected in 18.4 % of the male patients and 7.7 % of the female patients, with a slightly higher proportion found in the older age bracket. With some of the patients the clinical complications (mostly UAP) necessitated further operation on the artery affected. RePTCA had to be performed on 6.3 % of the patients and revascularisation by CABG was opted for in 1.6 % of the patients.

Positive family anamnesis, smoking, hypertension, diabetes mellitus, dyslipidaemia and obesity were evaluated as the main risk factors for ischaemic diseases (Fig. 2). The percentage of patients with a positive family anamnesis was around the 40% mark in all age brackets, apart from female patients up to 55 years of age, where there was not a single instance of positive family anamnesis. This then influenced the frequency of positive family anamnesis in this age bracket and the cohort as a whole. The reason for the zero value was probably the low number of female patients in the age bracket up to 55.

The patients were divided into three categories for evaluation of smoking as a risk factor: smokers, ex-smokers and non-smokers. Since a number of the patients who had been smokers had had to stop smoking as a result of acute ischaemic complications, the lion's share of the male patients (48.1% of the total) came under the „ex-smokers“ category. 60% of the female patients were „non-smokers“. Evaluation of the „smokers“ and „ex-smokers“ categories in conjunction produced alarming findings. These two categories accounted for more than 80% of patients in the younger age bracket of male patients and 67.6 % of males and 39.7 % of females out of the overall cohort. The average duration of smoking specified ranged from 30 to 35 years. In the case of women, where current „smokers“ made up a relatively small percentage (13.3 %), this indicates the long-term impact of this past risk factor. The number of cigarettes smoked per day ranged from 12 to 20 cigarettes on average. 40 % of „smokers“ or „ex-smokers“ reported that they smoked or had smoked more than 20 cigarettes a day.

Arterial hypertension, evaluated according to the WHO/ISH (International Society of Hypertension) criteria, was diagnosed in more than 60 % of cases out of the overall cohort – in 57.4 % of male patients and 73.3 % of female patients. The question remains as to why pharmacological treatment was only commenced for 88 % of the patients. The average duration of hypertension, ascertained directly from the patients, ranged from 8 to 14 years. The average time from diagnosis of hypertension in the younger age bracket (10 years) indicates that for some patients this risk factor was recorded and treatment was subsequently commenced at a relatively early age.

Diabetes mellitus (DM), another risk factor for the development of IHD, was recorded in 20.3 % of the patients. The female patients accounted for a greater proportion of the cases (33 %) in this instance, compared with less than 17% amongst the male patients. In a clear majority of cases (over 70 %), type 2 DM i.e. non-insulin-dependent diabetes was involved. The only exception consisted of the group of female patients over the age of 55, where 75 % of the diabetes sufferers were diagnosed with type 1 DM. The diabetes problem was further intensified by the fact that in the majority of cases, as with all the patients in this cohort, it was combined with excess weight or class I, II and III obesity.

The criteria applied for evaluation of the lipidogram were the recommended values used in clinical practice, which include total cholesterol under 5 mmol/l, HDL cholesterol over 1 mmol/l, LDL cholesterol under 3 mmol/l and triacylglycerols under 2 mmol/l. Cases when these recommended target values were exceeded were considered to constitute a risk factor for the incidence of IHD. Although laboratory evaluation of the lipidogram revealed average values which were more border-line than high-risk, hyperlipoproteinemia was detected in almost 74 % of the patients. The proportion of women was higher than men in this case and surprisingly this high-risk factor was recorded to a more significant extent in the younger age brackets – 83.3 % in the first age bracket compared with 68.9 % in the second.

In the majority of the patients hyperlipoproteinemia was only detected where clinical complications arose with pharmacological hypolipidemic treatment, predominantly using statins. The time indicated from diagnosis ranged from 2 to 7 years on average. The average values from the lipidogram exhibited higher (i.e. higher risk) values in women and in the younger age bracket as a whole, but the differences were not that significant. The table shows that the average values ranged around the upper limit of normal values. It must be taken into consideration with respect to this, however, that if hypolipidemic treatment is used on a patient who has suffered from myocardial infarction or has a history of symptomatic IHD, the patient should have lower total cholesterol and LDL cholesterol levels than the levels indicated for healthy patients.

The next step involved evaluation of the levels of the various lipidogram components in isolation, in view of the fact that the high levels of LDL cholesterol and low levels of HDL cholesterol could represent an independent risk factor in the development of ischaemic complications, even if the total cholesterol values appear to be normal. The results revealed frequent accumulation of values above the upper limit of the optimal range. In more than a third of the patients (35 % of the men, 20 % of the women) levels of at least two components of the lipid metabolism were high-risk and this phenomenon was again observed more in the younger age bracket. The impact of LDL cholesterol and total cholesterol was felt most strongly here. Conversely, there was not a single case in the entire cohort of patients where all four markers evaluated, i.e. total cholesterol, LDL cholesterol, HDL cholesterol and triacylgly-

cerol, exceeded the tolerated range simultaneously. When the findings were compared after six months, a shift towards the optimal values was registered in virtually every category. Amongst the female patients the total cholesterol, LDL cholesterol and triacylglycerol levels had fallen by an average of 8 %, with the greatest change recorded in the level of LDL cholesterol. On the other hand there had been a 10 % increase in favourable HDL cholesterol.

Amongst the male patients the fall in levels after six months was even more marked, with a 16 % decrease, with the most significant reduction observed in triacylglycerols. There was an average increase of approximately 8 % in HDL cholesterol. The concurrence, for example, of two lipidogram risk values, previously encountered in 35 % of the patients, had fallen to less than 16 %. On the basis of statistical evaluation of the significance of the changes in the various lipidogram components according to sex, a statistically significant difference ($p < 0.05$) was only recorded amongst the male patients. In addition to a significant decrease in the values for total cholesterol ($p = 0.0490$) and the desirable increase in HDL cholesterol ($p = 0.0227$), there was also an undesirable increase in LDL cholesterol ($p = 0.0265$) here. The change in triacylglycerol values was not statistically relevant ($p = 0.5875$). No significant change in the lipidogram was recorded amongst the female patients six months post-operation (total cholesterol $p = 0.1609$; LDL cholesterol $p = 0.1150$; HDL cholesterol $p = 0.0825$; triacylglycerols $p = 0.4154$). In this case, however, the results may have been influenced by the low number of female patients in the cohort examined.

Figure 1. Diagnosis of PTCA patients on hospital admission in years 2002–2004

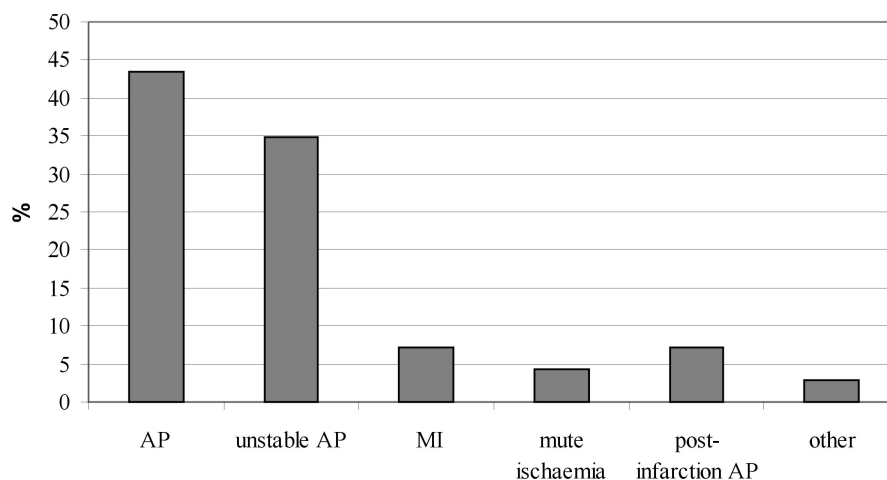
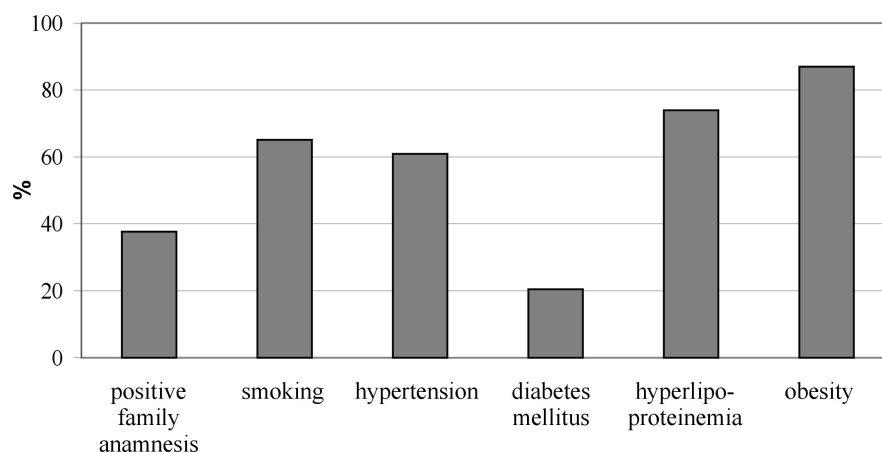


Figure 2. Risk factors in PTCA patients (54 men, 15 women)



Evaluation of body-weight parameters also revealed that only 13 % of the patients were of normal weight, whilst 87 % of them were suffering from overweight or obesity (Fig. 3). The values for both age brackets were similar in this respect and the differences between the men and women were only of the order of tenths of a percent. There were significant differences, however, in the level of obesity, with the female patients more gravely affected. Nearly half of them were suffering from class I and II obesity and 6.7 % of them had class III obesity. The WHR values also presented very unfavourable body fat distribution results, with 42.9 % of the men and 100 % of the women coming under the at-risk category. Similarly 83.7 % of the male patients and 100 % of the female patients were categorised as at-risk in terms of waist girth, used for orientational purposes. In patients with IHD the seriousness of a significant increase in body fat in conjunction with a predilection for deposition in the trunk, correlating positively with the quantity of visceral fat, was borne out. In the male patients, for whom central-type obesity was predominantly characteristic, body fat had accumulated in the chest and abdomen, whereas there had been a change in body fat distribution in the female patients with IHD. A considerable shift had occurred from the original gynoid-type obesity, with fat accumulation in the buttock and thigh region, towards male-type obesity, significantly increasing the risk of cardiovascular disease.

Considerable attention was also paid to evaluation of the concurrence of more than one risk factor in the same patient (Fig. 4). Results showed that only one patient (from the older male age bracket) was not diagnosed with any of the risk fac-

tors specified above. Conversely, the concurrence of three or more risk factors was found to be present in a high number of patients: 55.6 % of men and 40 % of women. The situation was extremely grave, primarily because of the fact that, in view of the patients' degree of affliction, measures leading to compensation had already been commenced, mostly by pharmacotherapeutic means. The graph shows that the category made up of three concurrent risk factors was the most numerous, accounting for 36.2 % of cases, with a higher proportion of female patients (67 %) than male patients (28 %). The three most frequent concurrent risk factors were obesity, hypertension and hyperlipoproteinemia. The category made up of patients with combinations of 4 risk factors accounted for nearly 25 % of cases, patients with combinations of 5 risk factors accounted for 16 % of cases and all 6 risk factors evaluated were found in 4.3 % of the patients, with a more significant proportion found amongst the female patients than the male patients. Overall evaluation of the risk accumulation revealed that the older age bracket (patients over the age of 55) was most at risk and that the male patients were more at risk than the female patients, a fact already underlined by the make-up of the cohort: 54 male patients and 15 female patients.

The Chi-square tests performed did not reveal a statistically relevant difference in the incidence of the risk factors between the sex and age categories. A fairly significant difference was detected only for presence of previous ischaemic complications – myocardial infarction was recorded more often in the male patients ($p < 0.05$) and the combined older age bracket ($p < 0.1$).

Figure 3. The BMI categories of obesity in PTCA patients (54 men, 15 women)

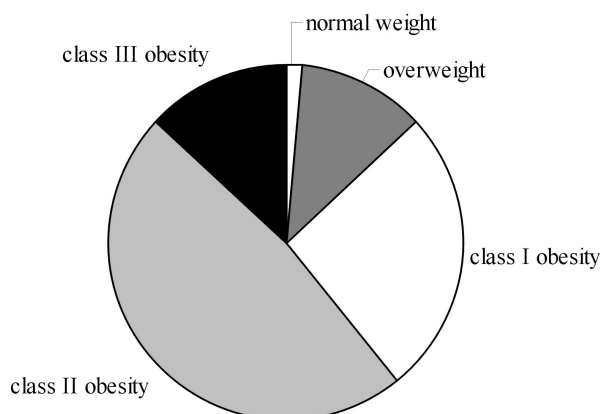
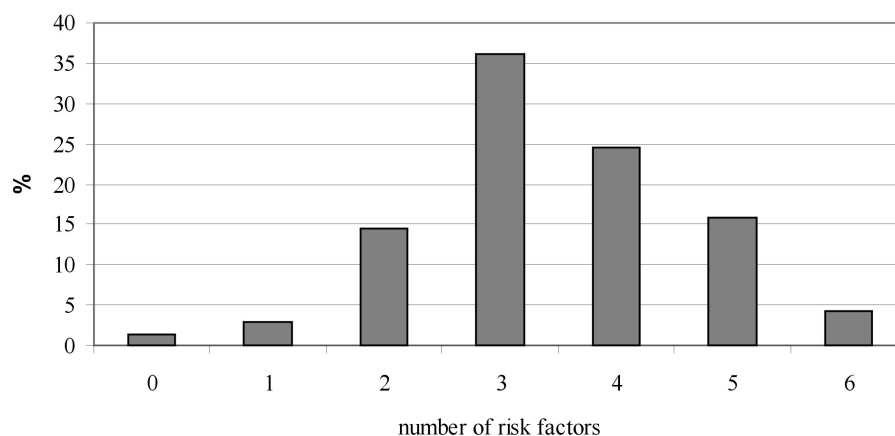


Figure 4. Coincidence of risk factors (positive family anamnesis, smoking, hypertension, diabetes mellitus, hyperlipoproteinemia, obesity) in PTCA patients (54 men, 15 women)



Discussion

According to the international MONICA (Tunstall-Pedoe, 2003) which investigated the problem of cardiovascular disease in 38 populations in 21 different countries from 1979 to 2002, the Czech Republic ranks amongst the countries with the highest incidence of the main risk factors monitored. The risk factors evaluated as most serious are smoking, hypertension, hyperlipoproteinemia and high BMI values. Yet the incidence of these risk factors in our cohort was considerably higher than (sometimes double) the findings recorded in the MONICA Project. Only with respect to the average total cholesterol value for the Czech Republic (6mmol/l) were the values for our cohort of patients lower when blood was taken. This is doubtless due to pharmacological intervention in most patients. It must be pointed out, however, that every year the American National Cholesterol Education Program (NCEP) Expert Panel lowers the target lipoprotein values in the blood considered safe, in particular for patients with clinical complications of atherosclerosis.

Recent years have witnessed considerable improvement in cardiovascular pharmacotherapy for patients recovering after myocardial infarction or revascularisation and the percentage of patients with total cholesterol concentrations below 5.2 mmol/l has also increased. Some areas still require attention though. Although 90 % of patients are now treated with hypolipidemic medication, LDL cholesterol target values are only achieved in half of patients (Marzili, Afinito, Focardi, 2006). The frequent incidence of weight gain and obesity remains a problem and hypertension has not yet been effectively evaluated. The findings of the Prospective Studies Collaboration (Sleight, 2003) collaborative meta-analysis, demonstrated that the 20 mm Hg decrease in systolic blood pressure in the 40–69 age bracket brought with it a 46–51 % reduction in the risk of cardiovascular mortality. A 40 % decrease was recorded in the 70–79 age bracket and a 33 % decrease in the 80–89 age bracket.

The STULONG Project (Boudik et al., 2006) produced similar findings. This 20-year study of primary prevention of risk factors of atherosclerosis in 1419 men aged 38 to 53 years living in Prague, analysing cardiovascular disease mortality, confirmed the seriousness of high cholesterol levels, hypertension and smoking. The influence of positive family anamnesis, however, was not statistically significant, unlike the situation in our cohort of patients.

Another risk factor monitored was diabetes mellitus, because cardiovascular diseases are the most common cause of morbidity and mortality in diabetics. The prevalence of diabetes has sadly doubled in the Czech Republic over the last 30 years and some 6% of the Czech population now suffer from diabetes (Danzig, Šimek, Šimková, 2006). Type-2 diabetics account for 95% of this figure. Diabetes mellitus is an independent risk factor for IHD, strokes and peripheral artery disease. Patients with diabetes are 2 to 4 times more at risk of MI than patients without diabetes. Epidemiological data shows that type-2 diabetics carry the same risk of mortality from cardiovascular disease as non-diabetics post myocardial infarction (Wrong et al., 2006).

Analyses in the Italian cohorts (20 647 men and women aged 35–69 years without previous CVD) indicate that BMI is positively and strongly related to the major cardiovascular risk factors. Risk factors as blood pressure, blood lipids and glycaemia are adversely influenced by excess body mass. Estimated cardiovascular risk reduction with BMI lowered were for men 3,8 % to 10,9 % for all cardiovascular events, 4,2 % to 12,1 % for CHD, and 2,3 % to 6,9 % for stroke; for women 2,8 % to

8,1 % for all cardiovascular events, 3,4 % to 9,8 % for CHD, and 2,1 % to 6,2 % for stroke (Panico et al., 2008).

Another prospective cohort study (among 13 230 healthy, middle-aged, non-smoking men) consider BMI as well. BMI was collected at baseline and after 8 years. Higher levels of baseline BMI were associated with an increased risk of CVD and knowledge of an increasing BMI over the prior 8 years did not improve the ability to predict risk of CVD. Men with a decline of more than 0,5 kg/m² were at an increased risk of CVD independent of current BMI, and the consideration of a long-term decline in BMI may be useful in evaluating risk of CVD, particularly among older men (Bowman et al., 2007).

Last but not least, the findings of the REACH Registry (Bhatt Deepak et al., 2006), an international, prospective, observational study, which collected data on atherosclerosis risk factors and treatment thereof, demonstrated that classic cardiovascular risk factors are consistent and common throughout the world and that atherothrombotic patients throughout the world have similar risk factor profiles: hypertension (81.8 %), hypercholesterolemia (72.4 %), diabetes mellitus (44.3 %). The findings also showed that the prevalence of overweight (39.8 %), obesity (26.6 %), and morbid obesity (3.6 %) were strikingly similar, irrespective of the vascular bed affected and irrespective of geographic locale.

Findings of The Melbourne Collaborative Cohort Study which investigated the relation between dietary patterns and mortality from IHD in an ethnically diversified population suggest that frequent consumption of traditional Mediterranean food is associated with reduced cardiovascular mortality after controlling important risk factors and country of birth (Hartus et al., 2007).

In addition to monitoring the risk factors, we also examined the success of coronary intervention in our cohort and the incidence of unwanted complications over the subsequent six-month period. Restenosis occurred in 16 % of cases and a further operation had to be performed in 13 % of cases: PTCA in 10 % and CABG in 3 %. Similar findings have been reported in a number of studies dealing with short-term and long-term problems after stent implantation, mostly compared with simple coronary angioplasty. The multicentre, randomised study Benestent II study (Seruys et al., 1998) recorded restenosis rates of 16 % in a group of patients with a stent and 31 % in a group after PTCA. Clinical complications including death, myocardial infarction, CABG or rePTCA were recorded in 12.8 % of patients with a stent and in 19.3 % of the group after PTCA. The European Antiplatelet Stent Investigation (EASI) (Rothman et al., 2001) international register revealed that, based on the findings for 257 patients, 13.5 % required revascularisation of the target artery. FINESSE (First International NIR Endovascular Stent Study) (Recio-Mayoral et al., 2007), another international register which evaluated results after stent implantation, produced a figure of 18.3 % for death, MI, NAP and need for myocardial revascularisation by aortocoronary bypass surgery or new PTCA over the course of six months. The multicentre REST study (REStenosis STent study) recorded lower incidence of restenosis (18 %) after stent implantation compared with after angioplasty (32 %) and also a reduction in the requirement for revascularisation of the target vessel: 10 % in the group with the stent and 27 % in the group after angioplasty. Virtually identical results were also reported by the START study (Tsuchikane et al., 1999).

Results of the study, evaluated the impact of general usage of stents on health care costs following percutaneous co-

ronary intervention, pointed out that general usage of stents, compared with balloon dilatation, during PTCA did not have any benefit on long-term clinical outcome or in-hospital care costs, although there was a reduced need for repeated revascularization during the first 12 months after the PTCA (Odell et al., 2008).

Conclusions

The central element for prevention of cardiovascular disease of atherosclerotic origin is to identify every possible way to influence the risk factors that can be influenced. The higher the absolute cardiovascular risk, the more effective the prevention. One of the components of the current prevention recommendations are the SCORE system tables, based on the standard risk factors. The SCORE system tables are applied across the globe as powerful predictors of IHD.

There was found close relation between presence of risk factors and ischaemic complications in our PTCA patients. As was seen above major part were obese patients with hypertension and hyperlipoproteinemia, smokers or ex-smokers even in the younger age bracket.

It is therefore important to understand that the vast majority of cases of IHD can be avoided. Targeted primary prevention is therefore of enormous importance for reducing cardiovascular mortality, as is the need for treatment of the main risk factors, which are a very significant contributor to the development of atherosclerosis and subsequent cardiovascular complications.

Závěr

Kardiovaskulární onemocnění se v české republice i v současnosti podílí vysokým procentem na celkové mortalitě. Přes tyto nepříznivé statistiky se však díky kvalitní lékařské péči a systému prevence kardiovaskulárních onemocnění věk dožití u pacientů neustále zvyšuje. Předkládaná publikace prezentuje dílčí výsledky čtyřleté multioborové studie kardiologických pacientů, která byla realizována Evropským centrem pro medicínskou informatiku, statistiku a epidemiologii v rozmezí let 2002–2004. Sledovány byly vybrané rizikové faktory v anamnestickém a fenotypovém profilu u 54 mužů a 15 žen ve věku nad 40 let, u kterých byla v rámci angioplastického zákroku provedena implantace koronárního stentu. Hodnocen byl hmotnostní profil pacientů na základě kategorizace hodnot BMI, údaje rodinné a osobní anamnézy, základní biochemické markery a pozámková symptomatologie v podobě incidence ischemických komplikací. Jednotlivé rizikové faktory byly analyzovány samostatně i ve vzájemné koincidenci. Výsledky jsou konfrontovány s údaji profilových kardiologicko-epidemiologických studií (MONICA, STULONG, STARTm REACH registru a další).

Klíčová slova: ischemická choroba srdeční, perkutánní transkaterární koronární angioplastika, rizikové faktory, koronární stenty, biostatistika.

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