

Department of Clinical Dietetics and Health Sciences, Medical University of Lublin

JANUSZ BIELAK, KATARZYNA ANIOŁ, RENATA KRZYSZYCHA

*Risk factors of ischaemic heart disease in patients
hospitalized due to various reasons*

In the post-war period, an intensive increase in cardiovascular diseases was observed in highly developed countries, which was associated with rapid development of industry and civilization. Nowadays, cardiovascular diseases are still one of the main causes of morbidity, mortality and permanent disability. In Poland, compared to other European countries, an extremely unfavourable situation is observed with regard to general mortality and an epidemic of cardiovascular diseases became the major health problem. Ischaemic heart disease (IHD) accounts for the highest mortality amongst cardiovascular diseases and therefore cardiologists all over the world are constantly interested in this problem. Poland is characterized by high IHD mortality, which is related to risk factors. The IHD risk factors are increasingly better understood; however, we are not able to eliminate them successfully and prevent the development of this disease.

The aim of the study was to evaluate whether the risk factors of ischaemic heart disease are known among patients hospitalized due to various reasons and whether the knowledge of those hospitalized because of arterial hypertension and myocardial infarction is the same as the one of those hospitalized for other reasons.

MATERIAL AND METHODS

The material concerning the demographic structure of the groups examined and risk factors of ischaemic heart disease was collected using a voluntary, anonymous questionnaire. The study included 65 individuals hospitalized in the District General Hospital in Tarnobrzeg at the departments of internal diseases, cardiology and otolaryngology. The patients were divided into 3 groups: group A – 19 patients (29%) hospitalized due to myocardial infarction, group B – 25 patients (39%) hospitalized due to arterial hypertension or other than cardiological reasons but treated for arterial hypertension, group C – 21 patients (32%) hospitalized for other than cardiological reasons.

The results were statistically analysed. The values of parameters were characterized by number and percentage. The differences between the groups for unrelated qualitative characteristics were detected by the λ^2 homogeneity test. The correlations between characteristics were examined by the λ^2 independence test. $P < 0.05$ was considered statistically significant for differences or correlations. The database and statistical calculations were based on Statistica 6.0 software (StatSoft, Poland).

RESULTS

Table 1 presents the demographic structure results of the population examined. The results were not statistically significant ($p > 0.05$). In groups A, B and C, the sex distribution was similar, the majority of responders were men. In the group hospitalized because of myocardial infarction (A) or other non-

cardiological reasons (C) most patients were between the ages of 41–60, while in the group with arterial hypertension (B), the majority of patients were over 60. In the groups B and C the town inhabitants dominated and in group A – patients living in the country. The patients hospitalized due to myocardial infarction and arterial hypertension had mostly primary and secondary education, while the majority of those hospitalized for other reasons had secondary education. The analysis of occupations in the group with arterial hypertension (B) showed that majority of patients were unemployed, received pensions or retirement pensions. All responders from groups A, B and C worked or are working physically.

Table 1. Demographic structure distribution

Factor examined	Group A (19 patients)		Group B (25 patients)		Group C (21 patients)		Significance of statistical differences
Sex	women men	32% 68%	women men	36% 64%	women men	38% 62%	AB p>0.05 AC p>0.05 BC p>0.05
Age	below 40 41-60 over 60	15% 53% 32%	below 40 41-60 over 60	16% 32% 52%	below 40 41-60 over 60	29% 38% 33%	AB p>0.05 AC p>0.05 BC p>0.05
Place of residence	village town	58% 42%	village town	44% 56%	village town	43% 57%	AB p>0.05 AC p>0.05 BC p>0.05
Education	primary basic secondary higher	26% 32% 32% 10%	primary basic secondary higher	36% 28% 28% 8%	primary basic secondary higher	29% 24% 43% 4%	AB p>0.05 AC p>0.05 BC p>0.05
The way of earning one's living	employed pension unemployed	47% 37% 16%	employed pension unemployed	32% 64% 4%	employed pension unemployed	43% 43% 14%	AB p>0.05 AC p>0.05 BC p>0.05
Type of work	physical mental	53% 47%	physical mental	68% 32%	physical mental	57% 43%	AB p>0.05 AC p>0.05 BC p>0.05

Table 2 presents the results concerning the behaviour which is likely to increase the risk of ischaemic heart disease. The analysis of the cardiac disease incidence in the family in the individual groups showed that almost half of patients after infarction (47%) and with hypertension (44) had such a history, while in families of the hospitalized due to other reasons no cardiac disease history was found; however, the differences were not statistically significant ($p>0.05$). In all groups analysed, the majority of patients did not smoke ($p>0.05$)

Table 2. Risk factors of ischaemic heart disease

Factor examined	Group A		Group B		Group C		Significance of statistical differences
Family history of cardiac diseases	yes	47%	yes	44%	yes	24%	AB p>0.05 AC p>0.05 BC p>0.05
Cigarette smoking	yes	21%	yes	20%	yes	14%	AB p>0.05 AC p>0.05 BC p>0.05

Cholesterol check-ups	yes	37%	yes	60%	yes	19%	AB p>0.05 AC p<0.05 BC p<0.05
Arterial pressure check-ups	every day	0%	codziennie	32%	codziennie	0%	AB p<0.05 AC p>0.05 BC p<0.05
	1 a week	11%	1 a week	40%	1 a week	24%	
	1 a month	63%	1 a month	28%	1 a month	39%	
	no	26%	no	0%	no	37%	
Sugar check-ups	yes	32%	yes	56%	yes	33%	AB p>0.05 AC p>0.05 BC p>0.05
Body weight check-ups	yes	58%	yes	92%	yes	57%	AB p<0.05 AC p>0.05 BC p<0.05
Preparation of meals	boiling or stewing	74%	boiling or stewing	80%	boiling or stewing	76%	AB p>0.05 AC p>0.05 BC p>0.05
	frying	26%	frying	20%	frying	24%	
Fats used for meal preparation	animal	10%	animal	4%	animal	10%	AB p>0.05 AC p>0.05 BC p>0.05
	plant	90%	plant	96%	plant	90%	
Frequency of fruit and vegetable intake	every day	69%	every day	76%	every day	52%	AB p>0.05 AC p>0.05 BC p>0.05
	1 a week	26%	1 a week	20%	1 a week	38%	
	1 a month	5%	1 a month	4%	1 a month	10%	
Frequency of alcohol intake	every day	0%	every day	0%	every day	4%	AB p>0.05 AC p>0.05 BC p>0.05
	1 a week	15%	1 a week	20%	1 a week	19%	
	1 a month	32%	1 a month	28%	1 a month	48%	
	no	53%	no	52%	no	29%	

The statistically significant differences were found in answers concerning blood cholesterol monitoring ($p<0.05$) between groups AC and BC. 37% of patients after myocardial infarction (A) confirmed that they checked the level of cholesterol vs 60% in the group with arterial hypertension (B). The patients hospitalized due to other than cardiological reasons (C) checked their cholesterol levels statistically significantly less frequently (19%). Moreover, statistically significant differences were observed in answers concerning arterial blood pressure monitoring between the patients with arterial hypertension and the remaining groups ($p<0.05$).

Only 32% of hypertensive patients confirmed daily pressure measurements, the majority of group B checked pressure once a week. In groups A and C nobody measured pressure every day. The majority of patients in these groups measured pressure once a month; an extremely alarming is the fact that 26% of patients after myocardial infarction did not monitor their blood pressure at all. A similar situation was observed in relation to blood sugar monitoring; however, the differences were not statistically significant ($p>0.05$). Only the majority of patients with arterial hypertension (B) check their sugar levels while the majority of those from groups A and C do not. All responders agreed that obesity significantly affected the development of ischaemic heart disease; the majority of responders measured their body mass, however patients with hypertension did it statistically more often (90%) than the remaining ones ($p<0.05$). All the responders answered that proper diet was likely to affect the development of ischaemic heart disease. In all groups examined the meals consumed were cooked or stewed ($p>0.05$). Such an answer was most common in the group with arterial hypertension (80%), it is upsetting though that 26% of patients after myocardial infarction indicated fried meals. All responders in groups A, B and C answered that they mainly used plant fats ($p<0.05$). Furthermore, there were no statistically significant differences in answers concerning the frequency of intake of fruits and vegetables

($p > 0.05$). In the group of myocardial infarction patients (A) 69% ticked off daily intake of fruits and vegetables compared to 76% in group B and 52% in group C. Over a half of the infarction (A) and hypertension (B) patients answered that they did not drink alcohol. Alcohol was most frequently consumed by patients hospitalized for other reasons (C), usually once a month – 48%; however, the differences were not statistically significant.

DISCUSSION

Ischaemic heart disease is a syndrome characterized by constant and paroxysmal heart ischaemia caused by substantial stenosis (sometimes complete) of the lumen of coronary arteries, which supply the heart muscle. It is the most frequent cardiovascular disease in highly-developed countries; myocardial infarction and sudden cardiac death are the most frequent causes of death. The average annual incidence of ischaemic heart disease amounts to about 250–300 new cases per 100,000 inhabitants. In the years 1960–1991 the mortality caused by ischaemic heart disease in Poland was very high and constantly increasing. Since 1991 a substantial decrease in death frequency, higher than in other countries, has been observed and this sudden change of trends indicates a reduction of final, fatal disease stages in patients with advanced coronary atheromatosis (1).

The incidence of IHD increases substantially with age, which is directly connected with increased arterial blood pressure (3). Most frequently in the 6th and 7th decades of life, over half of the population suffer from hypertension. According to the studies performed, those hospitalized due to arterial hypertension are mainly people above 60 years of age, who constituted 52% of the examined group, which confirms the previous statement. Among the patients after myocardial infarction, those at 41–60 constituted 53%. This is confirmed by the fact that more and more younger individuals develop myocardial infarction (3), which is mainly associated with the contemporary lifestyle, i.e. constantly on the run, in pursuit of work, money, frequently with no time to rest or to have a hot meal. Although arterial hypertension is the factor accelerating the development of ischaemic heart disease, the majority (63%) of those hospitalized due to myocardial infarction checked their pressure only once a month, whereas nobody from this group measured it every day. Similar results were obtained with regard to the patients suffering from other than cardiac conditions.

Ischaemic heart disease is more frequent in men than in women, which was confirmed by the studies – the group hospitalized after myocardial infarction and with hypertension were mainly men. In Poland, IHD is the main cause of hyper-mortality in men compared to women (1).

Premature occurrence of ischaemic heart disease and other vascular diseases in first degree relatives (with men before 55 years of age, with women before 65) is seen as an independent ischaemic heart disease risk factor (1). The conducted studies confirmed that over half of the hospitalized due to cardiological reasons confirmed the family history of cardiac diseases. There probably exists a family predisposition to ischaemic heart disease; however, to-date, neither the gene nor the group of genes thought to be responsible for ischaemic heart disease has been found.

One of the most important IHD risk factor is high blood cholesterol concentration, in particular high (above 130mg%) concentration of LDL in low density lipoproteins and low (below 35mg%) concentration of HDL cholesterol in high density lipoproteins. This relation is clearly linear, and additionally lipoprotein A is involved in the development of ischaemic heart disease (6). The obtained results reveal that the majority of patients did not pay proper attention to the value of this parameter, as among the patients hospitalized due to other causes, 81% did not measure the level of cholesterol, whereas among the surveyed after myocardial infarction – 63% .

An important ischaemic heart disease risk factor is obesity, and therefore it was a positive phenomenon

that most of the surveyed checked their body weight. Obesity highly increases the death risk, for which metabolic changes are responsible, mainly increased VLDL cholesterol concentration, decreased HDL, dense LDLs, retention of lipoproteins rich in triglycerides in blood, diabetes and arterial hypertension. Metabolic disorders are most often associated with abdominal obesity, which is also accompanied by an increased tendency to clot formation, due to elevated fibrinogen concentration (3).

Diabetes is a well know risk factor of atheromatosis and thus of ischaemic heart disease. Diabetes is not only associated with an increase in total cholesterol and triglyceride levels and a decrease in lipid metabolism, but also with increased residual VLDL production. In diabetic patients, the atheromatous changes in coronary arteries, e.g. the formation of atheromatous plaque and clots, are more extensive (5). Therefore, the results concerning the control of blood sugar level in the group of patients after myocardial infarction and among the hospitalized due to other than cardiac reasons are alarming, since the majority did not measure their blood sugar levels, i.e. they did not obey the basic principles of prevention.

One of the most important causes of ischaemic hart disease in Poland are bad dietary habits, connected with too abundant diets with excessive intake of animal fats and proteins, and simple sugars. According to the widely accepted opinion, nutrition that favors IHD prevention should be characterized by a low intake of saturated fatty acids, cholesterol and sodium, and a high intake of cellulose, vitamins and flavonoids (2). The studies conducted revealed that most of the hospitalized (over 90%) prepared their meals using vegetable fat, which was in accordance with prevention recommendations, since those fats have substantial antiatherogenic effects by lowering the cholesterol level. The majority of patients boiled or stewed their meals and consumed fruit and vegetables every day, which was particularly important due to the antioxidative vitamin content. The vitamins in fruit and vegetables prevent the harmful effects of free radicals, which play an important part in the formation of LDL cholesterol. Deficiency of antioxidative vitamins, B-carotene especially, increases the risk of cardiovascular system diseases and prolongs their treatment. Moreover, fruit and vegetables are rich in potassium, which lowers blood pressure. The organism possesses numerous defensive mechanisms to control the oxidative stress such as dietary antioxidants – vitamin E and carotenoids, in particular. Moreover, it should be remembered that the level of vitamins, antioxidative especially, decreases as a result of smoking (2).

Smoking is one the main external risk factors of atheromatosis of the coronary and cerebral arteries as well as lower limbs. It is considered to be one of the most important avoidable causes of ischaemic heart disease and myocardial infarction. Male smokers are at least twice as much burdened with ischaemic heart disease probability than the non-smoking ones. In the civilized countries, United States especially, the incidence of ischaemic heart disease and IHD-related mortality decreased, in particular in men, whereas among women no decrease has been observed. One of the important causes of this phenomenon is the growing number of Female smokers. 1–2 cigarettes smoked cause a cardiac action acceleration by 15–25 bites per minute, increase in arterial blood pressure by 10–20 mmHg (systolic) and 5–15 mmHg (diastolic) as well as increase of stroke volume by about 0.51/min./m₂ (4). Therefore, it is extremely worrying that among the surveyed as many as 21% after myocardial infarction and 20% with hypertension continue to smoke, which means that they do not obey the basic prophylactic principles.

It is a well-known fact that the amount of high-proof alcohol consumption in Poland is high. Its excessive consumption contributed to increased cardiac mortality. The relation between ethyl alcohol consumption and the development of ischaemic heart disease was pointed out in numerous epidemiological studies (1). Ethanol is a factor of atheromatosis and its complications, hyperlipaemia, diabetes type II and arterial hypertension. Despite those facts, several percent of all the surveyed admitted to the alcohol consumption once a week.

CONCLUSIONS

1. The examinations confirmed that: a) The incidence of ischaemic heart disease increases with age and the main risk factor is family predisposition to coronary disease; b) Myocardial infarction is found in younger and younger patients, which is mainly associated with the life-style; c) Ischaemic heart disease develops in men and women. In the material analysed the majority of hospitalized patients after myocardial infarction and with hypertension were men.

2. It was demonstrated that: The patients hospitalized due to myocardial infarction and other than cardiological reasons have insufficient knowledge about risk factors of ischaemic heart disease and generally do not follow basic prophylactic principles. The majority of patients with arterial hypertension know the IHD risk factors and have regular check-ups.

3. The majority of responders followed dietary orders, monitored body mass believing that this aspect is one of the most important ones in the battle against cardiac diseases.

REFERENCES

1. Bissinger A.: Choroba niedokrwienna serca. Lek. Rodz., 7, 18, 2002.
2. Ciborowska H., Rudnicka A.: Dietetyka. PZWL, Warszawa 2004.
3. Cybulska B., Szostak W.: Profilaktyka choroby niedokrwiennej serca w praktyce internistycznej. Post. Nauk Med., 14, 3, 2001.
4. Kośmicki M.: Palenie tytoniu przez pacjentów z chorobą niedokrwinną serca. Przew. Lek., 3, 38, 2001.
5. Mikołajczyk-Swatko A.: Cukrzyca jako czynnik ryzyka choroby wieńcowej i uszkodzenia serca. Nowa Klin., 7, 1040, 2000.
6. Sorrentino N. J.: Obniżenie stężenia cholesterolu w zapobieganiu chorobie wieńcowej. Med. po Dypl., 10, 97, 2001.

SUMMARY

The aim of the study was to evaluate whether the risk factors of ischaemic heart disease are known by the patients hospitalized due to various reasons, including cardiological ones. The material was collected using a voluntary, anonymous questionnaire. The results were analysed statistically by means of the χ^2 homogeneity test. The study encompassed the individuals hospitalized in various departments of the District General Hospital in Tarnobrzeg. The findings demonstrate that IHD incidence increases with age and that its main risk factor is family predisposition. Only the patients hospitalized for arterial hypertension mostly knew IHD risk factors, underwent systematic check-ups and applied basic preventive principles. The majority of responders complied with dietary recommendations believing that proper diet is one of the most important aspects in the battle against cardiac diseases.

Czynniki ryzyka choroby niedokrwiennej serca u osób hospitalizowanych z różnych przyczyn

Celem pracy była ocena znajomości czynników ryzyka choroby niedokrwiennej serca wśród osób hospitalizowanych z różnych przyczyn, m.in. z przyczyn kardiologicznych. Materiał do badań zebrano metodą dobrowolnej anonimowej ankiety. Uzyskane wyniki badań poddano analizie statystycznej za pomocą testu jednorodności χ^2 . Badaniem objęto osoby hospitalizowane na różnych oddziałach w Wojewódzkim Szpitalu Zespolonym w Tarnobrzegu. W pracy wykazano m.in., że częstość

występowania choroby niedokrwiennej serca rośnie wraz z wiekiem, a za podstawowy czynnik ryzyka należy uznać rodzinną predyspozycję do choroby wieńcowej. Jedynie hospitalizowani z powodu nadciśnienia tętniczego w większości znali czynniki ryzyka ChNS, poddawali się systematycznie badaniom kontrolnym oraz stosowali podstawowe zasady profilaktyki. Większość ankietowanych stosowała się do zaleceń żywieniowych, uznając właściwą dietę za jeden z najważniejszych aspektów w walce z chorobami serca.