Ocena nasilenia czynników ryzyka sercowo-naczyniowego w populacji pacjentów bez rozpoznanej choroby wieńcowej.

Assessment and management of cardiovascular risk factors in patients without diagnosed coronary heart disease.

ABSTRACT

Introduction

Atherosclerotic cardiovascular disease is one of the major causes of morbidity and mortality worldwide. Previous studies revealed that patients' age, gender, and specific genetic variants were related to increased risk of cardiovascular disease occurrence. Elevated blood pressure, increased glycemia, abnormal concentration of plasma lipids, obesity, smoking cigarettes, and low level of physical activity were proven to be very important modifiable cardiovascular risk factors. Lipid disorders contribute to the development of the atherosclerotic process and low-density lipoproteins play a major role in an atherosclerotic plaque formation, which is the main cause of coronary artery disease. Prevention strategies aimed at early identification of patients at high risk and adequate control of cardiovascular risk factors play a significant role in reducing morbidity and mortality due to cardiovascular diseases. Previously published studies showed inadequate control of the major cardiovascular risk factors in various European countries as well as in the Polish population. Therefore, further research regarding the assessment and management of cardiovascular risk factors is essential.

The aim of the study was to evaluate the occurrence and control of cardiovascular risk factors in patients without diagnosed coronary heart disease with particular attention to selected lipid parameters.

Methods

An observational, cross-sectional study was performed between spring 2018 and autumn 2019. Adult patients treated for hypertension, diabetes mellitus, or hypercholesterolemia, but without diagnosed coronary artery disease or other atherosclerotic cardiovascular disease were included in the analysis. Patients were invited for

an interview and assessed with a standardized questionnaire. Basic anthropometric parameters and blood pressure were measured. Every patient had a blood sample taken for measurement of biochemical parameters including the concentration of lipid fractions: total cholesterol (TC), low-density lipoprotein (LDL-C), high-density lipoprotein (HDL-C), triglycerides (TG), small dense low-density lipoproteins (sdLDL-C), and lipoprotein a [Lp(a)]. Index of the control of cardiovascular risk factors was created and included assessment of 8 parameters: blood pressure <140/90 mmHg, abdominal circumference <80 cm for women and <94 cm for men, normal BMI defined as 20,0-24,9 kg/m2, LDL-C <2,6mmo/l, TG <1,7 mmol/l, fasting glucose <100 mg/dl, non-smoker status, and adequate level of physical activity defined as performing regular exercises at least for 20 minutes 1-2 times per week. One point was added to the total index score for each of the above-mentioned parameters. High index score was defined as adequate control of at least 5 from 8 analyzed cardiovascular risk factors. The analysis was performed for the general population and subgroups by age, gender, and socioeconomic status. Univariate and multivariate logistic regression analysis was performed to assess the predictors of adequate control of cardiovascular risk factors and optimal lipids control [LDL-C <2,6 mmol/l (<100mg/dl) and TG <1,7 mmol/l (<150 mg/dl)], as well as elevated lipids concentration [LDL-C ≥3,6 mmol/l (≥140 mg/dl), TC ≥6,2 mmol/l (≥240 mg/dl), and TG ≥2,25 mmol/l (≥200 mg/dl)].

Results

The studied group consisted of 200 patients with majority of women (66,5%, p<0,001). Median age was 52 years [interquartile range (IQR) 43,0-60,0]. Hypertension was the inclusion criteria in 70% of patients, hyperlipidemia in 52,5%, and diabetes mellitus in 20,5%. The median value of adequate control index of the cardiovascular risk factors was 4,0 (IQR 3,0-5,0). The highest percentages of good control were observed regarding non-smoker status (85,0%), TG <1,7 mmol/l (81,5%), and blood pressure <140/90 mmHg (77,5%). LDL-C <2,6 mmol/l was observed in 23,0%, normal BMI in 36,0%, normal abdominal circumference in 37,0%, and adequate level of physical activity in 40,5% of the studied group. Better control of cardiovascular risk factors was observed in patients <60 years [4,0 (IQR 4,0-6,0) vs 3,0 (IQR 3,0-4,0), p<0,001], with higher education [5,0 (IQR 4,0-6,0) vs 3,0 (IQR 3,0-5,0), p<0,001], and professionally active [4,0 (IQR 3,0-6,0) vs 4,0 (IQR 3,0-5,0), p=0,014]. The control index increased with patient's income, with the lowest median value in patients with low and

very low material status and the highest in those with high material status [3,0 (IQR 3,0-4,0) vs 5,0 (IQR 4,0-6,0), p=0,001]. Patients who were not in a relationship had better control of cardiovascular risk factors [6,0 (IQR 4,0-6,0), p=0,005] in comparison to divorced/widowers [4,0 (IQR 3,0-5,0)] and married [4,0 (IQR 3,0-5,0)]. No differences were found regarding gender (p=0,731) and residence status (p=0,845). In all analyzed subgroups the lowest control rate was observed regarding BMI category, LDL-C, and abdominal circumference.

Studied group was characterized by high median TC 5,56 mmol/l (IQR 4,91-6,26) and LDL-C 3,29 mmol/l (IQR 2,68-4,00). Median value of HDL-C was 1,5 mmol/l (IQR 1,25-1,81), TG was 1,21 mmol/l (IQR 0,90-1,55), Lp(a) was 9,19 mg/dl (IQR 3,54-42,07), and sdLDL-C was 0,64 mmol/l (IQR 0,53-0,78). Men had lower HDL-C [1,33 mmol/l (IQR 1,18-1,54) vs 1,60 mmol/l (IQR 1,37-1,90), p<0,001] and higher TG [1,33 mmol/l (IQR 0,96-1,75) vs 1,13 mmol/l (IQR 0,88-1,44), p=0,03] in comparison to women. Patients <60 years of age had lower TC in comparison to older group [5,51 mmol/l (IQR 4,89-6,19) vs 5,72 mmol/l (IQR 5,07-6,95), p=0,045]. Patients with higher education and higher material status had lower TG concentration (p<0,001).

Higher material status [OR 2,05 (95% CI 1,11-3,79), p=0,022] and young age [OR 0,93 (95% CI 0,91-0,96), p<0,001] were independent predictors of adequate control of cardiovascular risk factors. Use of lipid-lowering agents was related with greater chance of achieving LDL-C <2,6 mmol/l [OR 2,1 (95% CI 1,05-4,19), p=0,035]. TG concentration <1,7 mmol/l was more likely in patients with higher economic status [OR 2,12 (95% CI 1,01-4,44), p=0,046] and lower abdominal circumference [OR 0,96 (95% CI 0,93-0,99), p=0,008]. The risk of highly elevated TC ≥6,2 mmol/l increased with age [OR 1,03 (95% CI 1,01-1,05), p=0,028] and decreased with higher material status [OR 0,19 (95% CI 0,04-0,82), p=0,026]. Patients with higher economic status were less likely to have LDL-C ≥3,6 mmol/l [OR 0,33 (95% CI 0,12-0,92), p=0,034]. Higher BMI was an independent risk factor of elevated TG ≥2,25 mmol/l [OR 1,14 (95% CI 1,02-1,29), p=0,02].

Conclusions

Control of cardiovascular risk factors covering adequate blood pressure, bodyweight, abdominal circumference, level of physical activity, smoking status, glycemia, and lipids concentration in patients without diagnosed coronary artery disease should be considered

unsatisfactory based on presented results. Younger patients and those with higher economic status were more likely to have adequate control of cardiovascular risk factors.

Analysis of lipid parameters revealed a highly elevated concentration of total cholesterol and LDL-C, especially in older patients. Independent predictor of adequate LDL-C concentration was the use of lipid-lowering drugs. Higher economic status and lower abdominal circumference were related to lower TG concentration. Older patients and those with lower economic status had a higher chance of elevated TC and LDL-C concentration.

Intensified prevention strategies should be focused particularly on early identification and treatment of dyslipidemias and obesity as well as improvement in the level of physical activity.

Key words: prevention, cardiovascular risk, risk factors, lipid profile, dyslipidemia, hypertension, diabetes mellitus