Educational program can favorably change the lipid profile in older people diagnosed with ischemic heart disease

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Introduction Cardiovascular diseases, including ischemic heart disease, are the most common cause of death worldwide,[1,2] and lipid disorders are the principal risk factors for cardiovascular diseases. It has been shown that a 10% reduction of total cholesterol level decreases the risk of acute coronary syndrome by 25%.[3] In the NATPOL PLUS study, the prevalence of hypercholesterolemia was 62% in women and 59.5% in men.[4] The respective values for women and men in the WOBASZ study were: 64% and 67%. In the POLSENIOR study, hypercholesterolemia was found in 66% of women and 56% of men, with the highest value (70%) observed in participants aged 65 to 69 years.[4] Disturbingly high low-density lipoprotein cholesterol concentrations (73%) were noted in a study conducted in patients after hospitalization for 6 to 8 months in cardiac wards.[5] Yet another study showed that only 28.1% of 83.6% of patients treated with statins had good hypercholesterolemia control.[6]

The aim of this study was to assess the impact of the educational program on lipid parameters in older patients.

Methods The study was carried out at the ANIN Specialist Cardiology Clinic of the Institute of Cardiology in Warsaw from 2014 to 2015. It was approved by the local ethics committee (no. IK-NP-0021-34/1433/14). A total of 200 patients treated in the clinic were included in the study. The patients were invited to participate in a series of training meetings aiming to improve lifestyle in order to change the lipid profile. The patients who were willing to participate in the educational program represented the interventional group, while the others were included in the control group. The 2 groups were categorized as the active group (group A) and the control group (group B). Initially, each group comprised of 100 patients. However, eventually 93 patients participated in the educational program (7 patients withdrew their consent to participate in the training sessions). A total of 88 patients reported for the follow-up biochemical analyses conducted 6 months after the end of the training program, and they formed the A1 group (interventional group at 6-month follow-up). The control group included 97 patients (3 patients withdrew from the study) and represented the B1 group (control group at 6-month follow-up). Follow-up biochemical analyses were performed in 97 patients. The inclusion criteria were: age 65 years and older, stable angina pectoris, pharmacologically treated hypertension and lipid disorders. The exclusion criteria were: unstable angina, heart failure, stroke, and diabetes. The training was conducted upon dividing the active group (93 patients) into 4 smaller subgroups. Each group participated in 3 educational meetings, 60 minutes each. The meetings took place on 3 consecutive days for each of the 4 groups. Every day, a different subject related to healthy lifestyle was discussed. The meetings were conducted by a nurse, a dietician, and a physical therapist with didactic experience. Moreover, every participant received educational materials and could consult health-related problems via the phone. However, none of the participants used this form of contact. The aim of the educational meetings

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was to discuss risk factors of ischemic heart disease, focusing especially on healthy eating habits and regular and safe physical activity. Venous blood cholesterol levels were measured in all the patients, from both the active and control groups at baseline and follow-up visit. The patients were instructed not to eat for 12 hours before the blood testing. Blood samples were transported to the laboratory directly after their collection. Furthermore, data on other active risk factors, such as physical activity, blood pressure values, eating habits, and body mass index, were also collected. The results of these studies have been analyzed and published.[7-9] The patients with abnormal lipid values were advised to seek medical consultation and modify treatment.

Statistical analysis For sample size calculation, it was assumed that 60% of the patients included in the study would have an increased cholesterol level. Moreover, assuming a significance level of 0.05, power of the test of 80%, and effect size of 33.3% for decreasing the percentage of individuals with an elevated cholesterol level in the active group, it was estimated that a statistically significant difference could be detected with 194 included patients, 97 in each of the groups. In order to assess the relationship between nominal variables and differences in the frequency distributions of responses between the groups, contingency tables were performed and the χ^2 test was used. For 2×2 tables, the Fisher exact test was used. Differences between continuous variables were tested using the *t* test. The calculations were performed in IBM SPSS 23.0 (IBM Corporation, Armonk, New York, United States). A *P* value of less than 0.05 was considered significant. Mean (SD) values were calculated.

Results and discussion There were no differences between active group A and control group B apart from a variable concerning the place of residence ($P = 0.011$). The study included 45% of women and 55% of men. The mean age was similar in both groups (group A, 69 years; group B, 70 years). Based on medical records, it was found that 60% of the patients in group A and 59% in group B were diagnosed with hypertension, and that 46% of the patients in group A and 38% in group B had a history of myocardial infarction. In addition, 32% of the patients from group A and 26% from group B declared that they were regularly using cholesterol-lowering drugs, 44% of the patients from group A and 30% from group B were using anti-platelet medications, 46% of the patients from group A and 43% from group B were regularly using hypotensive drugs, while 67% of the patients from group A and 73% from group B were treated with β-blockers.

After completing the training program, triglyceride levels were lower in the active group A1 compared with active group A ($P = 0.022$). Differences ($P = 0.023$) were also observed in high-density lipoprotein cholesterol between group A1 and group B1. The results are presented in TABLE 1.

Various authors indicated the need for further educational efforts within secondary prophylaxis in order patients to prevent future cardiovascular events, as shown by Gołuchowska et al.[10] In Poland, inpatient stationary cardiac rehabilitation programs are the most common, but outpatient programs are rare.[11] The study showed that effective outpatient education is feasible with the use of an innovative educational program. Rushford et al[12] demonstrated in patients hospitalized after acute coronary events that there is a need for further prevention in outpatient clinics. This conclusion has been supported by Jankowski et al,[13] who noticed that the greatest improvement resulted from education conducted by primary care physicians. There are a number of health-oriented educational models worth attention. CHANGE (Care of Health Advertising New Goals for Elderly People) and EUROCATION projects have improved risk factor control.[14,15]

The designed and implemented author-constructed outpatient educational program intended for elderly patients improved some lipid parameters in the investigated population.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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TABLE 1 Differences between the test group and the control group before and after the intervention

Parameters before intervention		Active group A (n = 100)	Control group B (n = 100)	*P* value
Age, mean (SD)		69 (3.77)	70 (4.00)	0.09[b]
Sex, n (%)	Women	47 (47)	43 (43)	0.57[a]
	Men	53 (53)	57 (57)	
Place of residence, n (%)	Urban areas	95 (95)	84 (84)	0.01[a]
	Rural areas	5 (5)	16 (16)	
Education, n (%)	Vocational	27 (27)	22 (22)	0.32[a]
	Secondary	44 (44)	39 (39)	
	Higher	29 (29)	39 (39)	
Hypertension, n (%)		60 (60)	59 (59)	0.89[a]
Myocardial infarction, n (%)		46 (46)	38 (38)	0.25[a]
Drinking alcohol, n (%)		65 (65)	64 (64)	0.88[a]
Lifestyle, n (%)	Sedentary	68 (68)	70 (70)	0.76[a]
	Active	32 (32)	30 (30)	
Weight, kg, mean (SD)		83.8 (16.6)	82.2 (16.2)	0.50[b]
Height, cm, mean (SD)		168.9 (8.72)	169.1 (8.79)	0.84[b]
Total cholesterol ≥4.5 mmol/l, mean (SD)		4.74 (1.06)	4.75 (0.81)	0.90[b]
Total cholesterol ≥4.5 mmol/l, n (%)		59 (59)	60 (60)	0.89[a]
LDL ≥2.5 mmol/l, mean (SD)		2.98 (0.9)	3.01 (0.7)	0.83[b]
LDL ≥2.5 mmol/l, n (%)		64 (64)	75 (75)	0.09[a]
HDL ≤1.2 mmol/l in women, ≤1.0 mmol/l in men, mean (SD)		1.34 (0.26)	1.36 (0.31)	0.57[b]
HDL ≤1.2 mmol/l in women, ≤1.0 mmol/l in men, n (%)		18 (18)	18 (18)	1.00[a]
TG ≥1.7 mmol/l, mean (SD)		1.65 (0.55)	1.63 (0.53)	0.80[b]
TG ≥1.7 mmol/l, n (%)		47 (47)	39 (39)	0.25[a]
Parameters after intervention		**Active group A1 (n = 93)**	**Conrol group B1 (n = 97)**	***P* value**
Total cholesterol ≥4.5 mmol/l, mean (SD)		4.43 (0.78)	4.53 (0.72)	0.38[b]
Total cholesterol ≥4.5 mmol/l, n (%)		43 (48.9)	52 (53.6)	0.52[a]
LDL ≥2.5 mmol/l, mean (SD)		2.72 (0.73)	2.82 (0.64)	0.36[b]
LDL ≥2.5 mmol/l, n (%)		53 (60.2)	64 (65.9)	0.51[a]
HDL ≤1.2 mmol/l in women, ≤1.0 mmol/l in men, mean (SD)		1.41 (0.27)	1.43 (0.35)	0.67[b]
HDL ≤1.2 mmol/l in women, ≤1.0 mmol/l in men, n (%)		7 (8.0)	19 (19.6)	0.02[a]
TG ≥1.7 mmol/l, mean (SD)		1.49 (0.45)	1.50 (0.46)	0.90[b]
TG ≥1.7 mmol/l, n (%)		27 (30.7)	27 (27.8)	0.67[a]
Parameters after intervention		**Compared groups**	**χ^2 test**	***P* value**
Total cholesterol		A vs A1	1.94	0.16[a]
		B vs B1	0.82	0.37[a]
LDL cholesterol		A vs A1	0.28	0.59[a]
		B vs B1	1.93	0.17[a]
HDL cholesterol		A vs A1	3.44	0.06[a]
		B vs B1	0.08	0.78[a]
TG		A vs A1	5.22	0.02[a]
		B vs B1	2.76	0.10[a]

a χ^2 test; **b** *t* test

Abbreviations: HDL, high-density lipoprotein; LDL, low-density lipoprotein; TG, triglycerides

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