Gender differences in lifestyle components among patients with coronary heart disease

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Numerous studies had shown that lifestyle modifications can reduce the risk for subsequent coronary events or death in patients with pre-exiting coronary heart disease (CHD). Stopping smoking, regular physical activity and making healthy food choices are an integral part of total risk management in patients with CHD. We evaluated gender differences in lifestyle components of secondary prevention for CHD (smoking status, physical activity and dietary fat intake) in patients with established CHD. This prospective trial included 130 randomly selected patients from Family Medicine Teaching Center Tuzla (66 men and 64 women), aged 40-80 years, with established CHD. We determined smoking status in all participants and assessed dietary fat intake by using modified Dietary Intake Nutrition Evaluation method (DINE). We assessed intensity of physical activity in all participants by using Borg scale for perceived exertion. Mean age of participants was 64.9 ± 7.8 years; 28/130 patients were daily smokers (22%), while 60/130 patients were ex-smokers (46%). More than one third of patients had never smoked (32%), with significantly more women than men ($p = 0.003$). Mean dietary fat intake was 35.4 ± 6.0 g/day; 59/130 patients self-reported regular physical activity (45%). Mean intensity of physical activity was 9.3 ± 1.6 and significantly higher in men than in women ($p = 0.002$). Results of this study showed unhealthy lifestyles in patients with coronary heart disease that indicates the need for more effective intervention by primary care teams to change behavior and modify lifestyles in order to reduce risk for recurrent coronary events.

Key words: Lifestyle, Components, Coronary heart disease.

Introduction

Cardiovascular disease is the leading cause of death worldwide and contributes to nearly one third of all global deaths. By 2020 approximately 25 millions deaths annually are expected from cardiovascular disease, and almost half of those deaths will be related to coronary heart disease (1). According to the limited statistical data, we can conclude that

cardiovascular disease is a leading cause of morbidity and mortality in our country, for men, as well for women, causing 50% deaths of the total mortality. In addition, because of inadequate health culture in the community (high prevalence of smoking, alcohol consumption, obesity, physical inactivity, unhealthy diet and obesity) we can expect a further trend of increasing cardiovascular morbidity and mortality (2).

Numerous studies have shown that lifestyle modifications can reduce the risk for subsequent coronary events or death in patients with pre-existing coronary heart disease (3). Causal relationship between cigarette smoking and increased risk for cardiovascular disease is strong, continuing, linear and independent. Clinical trial evidence suggests that reduction or modification of dietary fat intake may be sufficient to reduce cardiovascular events in certain patients (4,5). The Lion Diet Heart Study found that among survivors of the first myocardial infarction, those who followed a Mediterranean diet (rich in monounsaturated fatty acids) for a mean of 46 months, had a significantly lower risk of cardiac death or recurrent myocardial infarction than those who followed a Western-type diet (14 vs. 44 events; $p < 0.001$) (5). Physical inactivity is one of a major independent risk factors for coronary heart disease. Inactive people have twice the risk of dying from coronary heart disease as active people. The epidemiologic evidence indicates that physical activity can reduce risk for recurrent cardiovascular events in patients with coronary heart disease. An exercise program will significantly increase patient survival and reduce all-cause mortality (6, 7). Physical activity also has a positive effect on other risk factors for coronary heart disease including reducing blood pressure in people with hypertension, improving blood lipid profiles and improving insulin sensitivity (8).

An integral part of the work of primary care physicians for patient's health is prevention of disease and health promotion. Most people with coronary heart disease come to the primary care surgery thinking that primary healthcare professionals are persons who will suggest and give advice regarding regular use of antihypertensive medications, anti-platelet agents, lipid lowering therapy, as well as lifestyle modifications. Optimal secondary prevention includes control of medical components of secondary prevention for coronary heart disease (blood pressure < 140/90 mmHg, serum total cholesterol level < 4,5 mmol/l, prophylactic use of secondary preventive therapies), as well as promotion of healthy lifestyles (smoking cessation, regular physical activity, moderate alcohol consumption, healthy diet and weight reduction if overweight or obese). Interventions to change behaviour and modify lifestyles are an integral part of the primary care physician's tasks for the patient's health. However, many investigations have shown a high prevalence of unhealthy lifestyles in patients with coronary heart disease (9, 10).

Little is known about current lifestyle components of secondary prevention for coronary heart disease among patients in primary health care. This is why we studied lifestyles among patients with coronary heart disease in primary health care to assess lifestyle components of secondary prevention for coronary heart disease and to investigate possible gender differences in lifestyles of patients with coronary heart disease.

Material and methods

This trial was conducted as a prospective, randomized controlled study that enrolled 130 randomly selected patients from the Family Medicine Teaching Center, Tuzla, aged 40-80 years: 66 men (50.8%) and 64 women (49.2%). Every consecutive patient with established coronary heart disease,

who came to the family physician's office for examination during the period March-July 2006, was included in this study. No patient refused involvement in this study. Notes from medical records were reviewed to ensure that patients were documented by hospital or cardiologist letters as having coronary heart disease. We placed a limit of 130 patients for data collection. All patients gave informed consent to the study before attending the clinical assessment.

The main outcome measures were lifestyle components of secondary prevention for coronary heart disease: smoking status of all participants, dietary fat intake, and physical activity. According to the Third Joint European Societies Recommendations on Prevention of Coronary Heart Disease in Clinical Practice criteria used to define appropriate lifestyle, the components of secondary prevention for coronary heart disease were low fat diet, moderate physical activity and not currently smoking (11).

Patients were asked about their smoking habits at base line. Smoking status was analyzed by a questionnaire according to the Standard Questions on the Use of Tobacco among Adults (12). Smokers were defined as persons who smoke daily or occasionally. Ex-smokers were defined as persons who do not smoke at all now, but smoked at least 100 cigarettes or a similar amount of other tobacco products in their lifetime. Never smokers are persons who do not smoke now and have smoked fewer than 100 cigarettes or similar amount of other tobacco products in their lifetime.

Dietary fat intake was assessed by using a modified Dietary Intake Nutrition Evaluation (DINE) questionnaire which provides a quick assessment of an individual's diet by adding the scores relevant to the frequency of consumption of the groups of foods to give a total fat score. For fat, three categories were then derived grouping the scores: low intake (less than 30), medium intake (30-40)

and high intake (more than 40). A total fat score of 30 or less on the DINE is estimated to represent a fat intake of 83 grammes per day (g/day) or less, which corresponds to about 35% of the energy recommended dietary allowance for adults. A score of 40 or more indicates a fat intake greater than 122 g/day, or about 40% of energy (13).

Physical activity more than three times a week, at least 30 minutes, was considered as regular physical activity. We assessed the intensity of physical activity in all participants by using a Borg scale for rating perceived exertion (RPE). This is a scale of how a person is feeling while exercising, which ranges from 6 to 20. RPE is a psychophysical scale developed to have a high correlation with heart rates and other metabolic parameters. The RPE scale subjectively measures exercise intensity by using other metabolic parameters. The RPE scale subjectively measures exercise intensity by using verbal expressions to evaluate the perception of effort during walking or running. The RPE scale 6 corresponds to sedentary physical activity, number 7 to 10 to light physical activity, number 11 to 14 to moderate physical activity, and number 15 and more corresponds to hard physical activity (14).

We used Arcus Quickstat Biomedical to manage data and standard statistical methods for statistical analysis. The chi-square test with significance of $P < 0.05$ and independent samples t test respectively were used for comparing proportions and means between groups. We expressed effect size as the difference between groups with a 95% confidence interval.

Results

This trial included 130 patients from the Family Medicine Teaching Center, Tuzla with established coronary heart disease: 66 men (50.8%) and 64 women (49.2%). There were no significant differences in propor-

tions of participants related to gender (p = 0.8041) and age (p = 0.4501). Significantly more men had diagnosis of myocardial infarction than women (p = 0.0002), while significantly more women had diagnosis of angina than men (p = 0.0002). Characteristics of patients with coronary heart disease are shown in Table 1.

Table 1 Characteristics of patients with coronary heart disease

Characteristics	Patients with coronary heart disease		
	Men	Women	Total
Number of participants (n; %)	66; 50.8	64; 49.2	130; 100.0
Age (years; $\bar{x} \pm SD$)	65.8 ± 8.0	64.2 ± 7.5	64.9 ± 7.8
Diagnosis			
Myocardial infarction (n; %)	34; 51.5	13; 20.3	47; 36.2
Angina (n; %)	32; 48.5	51; 79.7	83; 63.9
Complications			
CABG (n; %)	11; 16.7	3; 4.7	14; 10.8
PTCA (n; %)	2; 3.0	1; 1,6	3; 2.3
CHF (n; %)	32; 48.5	24; 37.5	56; 43.1

CABG = coronary artery bypass grafting; PTCA = percutaneous transluminal coronary angioplasty; CHF = congestive heart failure.

Analysis of smoking status of patients with coronary heart disease indicated that 28/130 patients were daily smokers (22%), while 60/130 patients were ex-smokers (46%). Approximately one third of patients never smoked (32%). Significantly more women than men had never smoked (p = 0.003). According to the DINE questionnaire about fat intake we found that 23/130 patients had a low fat diet (17%), 79/130 patient had moderate fat intake (61%), while 28/130 patients had high fat intake (22%). We did not find significant differences for any category of fat intake related to gender. Fifty nine patients self-reported regular physical activity (45%), while more than half of patients had no regular physical activity (55%). Significantly more men had regular physical activity compared with women (p = 0.0017). According to the Borg scale for rating perceived exertion, sedentary physical activity was reported in 3/130 patients (2%), while 110/130 patients had light physical activity (85%). Only 17/130 patients had moderate physical activity (13%), and no one had hard physical activity. We did not find any significant differences in level of physical activity

Table 2 Lifestyle components in patients with coronary heart disease

Lifestyle components	Men		Women		Total	
	n	%	n	%	n	%
Smoking status						
Smokers	17	25.8	11	17.2	28	21.5
Ex-smokers	35	53.0	25	39.1	60	46.2
Never smokers	14	21.2	28	43.8	42	32.3
Fat intake						
≤ 83 g/day	14	21.2	9	14.1	23	17.7
84-122 g/day	41	62.1	38	59.4	79	60.8
> 122 g/day	11	16.7	17	26.6	28	21.5
Physical activity						
Regular	38	57.6	21	32.8	59	45.4
No regular	28	42.4	43	67.2	71	54.6
Intensity						
Sedentary	–	–	3	4.7	3	2.3
Light	57	86.4	55	85.9	110	84.6
Moderate	9	13.6	6	9.4	17	13.1
Hard	–	–	–	–	–	–

related to gender, except that significantly more women had sedentary physical activity than men (p = 0.0376). Data are shown in Table 2.

Mean dietary fat intake was 35.4 ± 6.0 per day with no significant difference related to gender (35.1 ± 6.5 vs. 35.7 ± 5.5; p = 0.554). Generally, all patients had moderate fat intake and light physical activity. Mean level of physical activity was 9.3 ± 1.6, and it was significantly higher in men than women (9.7 ± 1.4 vs. 8.9 ± 1.6; p = 0.002). Patients smoked average 18.5 ± 15.2 cigarettes daily. The mean number of cigarettes smoked daily was significantly higher in men compared with women (22.7 ± 17.2 vs. 10.8 ± 5.8; p = 0.037). Mean values of lifestyle components in patients with coronary heart disease are shown in Table 3.

Table 3 Mean values of lifestyle components in patients with coronary heart disease

Lifestyle components	Men ($\bar{x}$ ±SD)	Women ($\bar{x}$ ±SD)	Total ($\bar{x}$ ±SD)
Fat intake	35.1 ± 6.5	35.7 ± 5.5	35.4 ± 6.0
Physical activity	9.7 ± 1.4	8.9 ± 1.6	9.3 ± 1.6
Number of cigarettes	22.7 ± 17.2	10.8 ± 5.8	18.5 ± 15.2

Discussion

The overall objective of coronary heart disease prevention is to reduce the risks for subsequent coronary events, and thereby reduce premature disability, mortality and to prolong survival. Opportunities for family physicians and general practitioners to undertake preventive activities for coronary heart disease and other cardiovascular diseases in clinical practice are possible, but are not optimally realized.

Lifestyle changes can modify coronary heart disease and significantly contribute to reduction in cardiovascular mortality in established coronary heart disease. Evidence is available that stopping smoking, taking more exercise, losing weight, drinking less alcohol, and eating a more favourable diet can all play a part in secondary prevention of CHD (3). General practitioners have been encouraged to target patients with coronary heart disease for secondary prevention, but putting this into practice has proven challenging.

Our results showed unhealthy lifestyles among patients with coronary heart disease in family practice. Despite the benefits of smoking cessation in order to reduce cardiovascular risk and recurrent coronary events, 22% of our patients continue to smoke. Generally, all patients in our trial had moderate fat intake and light physical activity and more than half of them had no regular physical activity.

Results of EUROASPIRE II study showed a high prevalence of unhealthy lifestyles, modifiable risk factors (21% of patients smoked cigarettes) and inadequate use of drug therapies to achieve blood pressure and lipid goals. There is considerable potential throughout Europe to raise the standard of preventive cardiology through more effective lifestyle intervention, control of other risk factors and optimal use of prophylactic drug therapies in order to reduce coronary morbidity and mortality (8).

Numerous prospective investigations demonstrated a substantial decrease in coronary heart disease mortality for former smokers compared with continuing smokers. Persons with diagnosis of coronary heart disease experience as much as a 50% reduction in risk of myocardial re-infarction, sudden cardiac death, and total mortality if they quit smoking after the initial heart infarction (15). Our results showed that 22% patients with coronary heart disease smoked, which is similar to other studies that analyzed secondary prevention in primary care (8, 9). We did not find any difference in the proportion of patients who smoked related to gender, but men smoked significantly more cigarettes than women (p = 0.037).

Many trials indicate that incorporating moderate-intensity activities into the lifestyle may have benefits for coronary risk factors comparable to those derived from structured exercise programs (6, 7). More than half of patients in our trial had no regular physical activity (55%) which was significantly more in women than men (67.2% vs. 42.4%; p = 0.0118).

The effects of dietary modification in secondary prevention were investigated more than 30 years ago by the Oslo Diet-Heart Study, in which survivors from myocardial infarction were given a low fat diet. Results of this study showed reduction in fatal and nonfatal myocardial infarction by 37% at 5 years, while the rate of coronary mortality was decreased by 44% (16). Most patients in our study, more than half of them (61%) had moderate fat intake and they took 84-122 g/day of fat in their diet with no significantly differences in mean fat intake between men and women (35.1 ± 6.5 vs. 35.7 ± 5.5; p = 0.554).

The American Heart Association Guidelines for Preventing Cardiovascular Disease in Women emphasize focusing on the lifetime heart disease risk for women 20 years and older. The new American Heart Association Guidelines for women's heart disease prevention strategy has three main components. These include: living a healthy lifestyle, addressing heart risk factors, and using medications appropriately. Recommendations are included on physical activity, nutrition, and smoking cessation, as well as detailed recommendations on blood pressure treatment, cholesterol, hormone and aspirin therapy, and use of supplements based on new data (17).

Results of our trial showed that all the lifestyle components of secondary prevention for coronary heart disease were being managed suboptimally. Management was worse in the women, but not significantly. Male patients showed a higher mean level of physical activity than women (9.7 ± 1.4 vs. 8.9 ± 1.6; p = 0.002), but generally a gender-equal level of physical activity and dietary fat intake was established for patients in secondary prevention of coronary heart disease in our primary health care. The exception was sedentary physical activity, which was significantly higher in women than men (p = 0.0376).

Conclusion

Results of this study showed unhealthy lifestyles in patients with coronary heart disease, especially in women. Integrating comprehensive lifestyle changes into standard cardiovascular risk modification programs may be the necessary first step towards improving care for patients with coronary heart disease. It indicates more effective primary care teams intervention to change behaviour and modify lifestyles in order to reduce risk for recurrent coronary events. It will require more effective public health messages and changes in healthcare systems that promote a healthy lifestyle.

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