"Heart without smoke" educational campaign — the role of patient education in secondary prevention of cardiovascular disease

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Abstract

Background: Nicotine addiction is the strongest factor in the increase of the risk of recurrent ischaemic events.

Aim: The aim of the study was to analyse the effectiveness of a smoking cessation educational programme in a population of patients hospitalised with acute myocardial infarction within the "Heart without smoke" campaign.

Methods: In this study, we included 100 consecutive patients, active smokers, hospitalised with acute myocardial infarction (STEMI or NSTEMI) at the Centre for Invasive Cardiology, Angiology, and Electrotherapy in Pinczow, Poland in the period from January to December 2015 (12 months). Patients were participants in the educational campaign about tobacco addiction "Heart without smoke".

Results: At one-month follow-up observation: 61 patients had quit smoking and an additional 35 had decreased the number of cigarettes smoked per day. During six-month follow-up interview: 51 patients did not smoke cigarettes (13 had returned to smoking, three had additionally stopped smoking, one person had died). There were no statistically significant correlations between smoking cessation and gender ($p = 0.4$; $p = 0.2$), age ($p = 0.8$; $p = 0.8$) and length of prior smoking habit ($p = 0.8$; $p = 0.5$) and daily cigarette consumption before myocardial infarctions ($p = 0.3$; $p = 0.3$), one month, and six months after hospital discharge, respectively.

Conclusions: Constant education of patients after myocardial infarction was an effective method for smoking cessation in over 50% of smokers six months after myocardial infarction.

Key words: nicotine, tobacco smoking, secondary prevention, myocardial infarction, educational campaign

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INTRODUCTION

Secondary prevention of cardiovascular disease (CVD) aims to prevent the recurrence of cardiovascular events, e.g. myocardial infarction (MI) in patients already diagnosed with CVD. It involves the optimal pharmacotherapy and modification of the risk factors, understood as lifestyle changes in the area of physical activity, diet, and addiction habits like smoking. Tobacco smoking is a primary factor of premature death, cancer, respiratory disease, as well as coronary artery disease occurrence [1, 2]. Smoking status is a basic variable in almost all current CVD risk estimation scores for use in apparently healthy persons, next to sex, age, total cholesterol, high-density lipoprotein cholesterol, systolic blood pressure, diabetes mellitus, and hypertensive treatment. Nicotine addiction is the strongest factor in the increase of the risk of recurrent ischaemic events [3]. A person who is an active smoker has a 50% probability of dying due to smoking, and on average will lose 10 years of life [4]. It is much more than for

other risk factors, e.g. the occurrence of severe hypertension leads to three years loss of life, and mild hypertension about one year [5]. In the last three decades, more than half of the decrease in CVD mortality has been attributed to reduction in cholesterol and blood pressure levels, but also smoking. European Society of Cardiology guidelines on CVD prevention emphasise that risk factor goals and target levels are no exposure to tobacco in any form, which means complete cessation [3]. Based on data from the Polish WOBASZ II study, in Poland 30% of men and 21% of women smoke, the shares being 9% and 4% lower for men and women, respectively, in comparison with the first WOBASZ study (p < 0.001) [6]. The NATPOL 2011 study indicated a comparable number of smoking men (31.5%), more women (27.5%), and showed a decrease in the prevalence of smoking for both genders in the period from 2001 to 2011 [7]. A promising observation is that since 2003 Polish adults significantly advanced their cardiovascular health knowledge about risk factors [8]. New data on the epidemiology of smoking in the Polish population show that the prevalence in men is 31% and in women 18%, which is still higher compared to Western European countries [9]. In the Polish part Global Adult Tobacco Survey in the years 2009 to 2010, reported socio-demographic factor correlates of daily cigarette smoking are: lower educational level, unemployment, living in urban areas, and age between 20 and 59 years [10]. The World Health Organisation revealed that the number of deaths associated with smoking-related diseases exceeded 100 million in the 20th century [11]. In Poland, every year approximately 70,000 people die as a result of smoking [12, 13]. Quitting smoking is associated with 36% risk reduction of all-cause mortality among patients with CVD and is substantial compared with other secondary preventive therapies such as cholesterol lowering and standard pharmacotherapy [14]. The AHA/ACCF Secondary Prevention and Risk Reduction Therapy for Patients with Coronary and Other Atherosclerotic Vascular Disease recommend that patients should be asked about smoking status and advised at every office visit. Additionally, patients should be assisted by medical personnel by helping them create a plan for quitting [15]. The help could concentrate solely on pharmacotherapy, but one cannot forget about patient participation in smoking cessation social campaigns or programmes that address the issue. Nowadays, these kinds of programmes are created and propagate among patients, and their results are promising [16]. An intensive smoking-cessation intervention programme is more effective than a stepped-care approach [17], but data show that fewer than 20% of smokers had used any recommended aid to quitting smoking. People in countries with developed tobacco cessation programmes have increased likelihood of using efficacious cessation aids [18]. Thus, expansion of smoking cessation aid that induces and maintains long-term smoking quitting in patients is required.

The aim of the study is to analyse the effectiveness of a smoking cessation educational programme in a population of patients hospitalised with acute myocardial infarction (AMI) within the "Heart without smoke" campaign.

METHODS

A total of 100 consecutive patients, active smokers, were enrolled to the study. Patients were hospitalised with AMI (STEMI or NSTEMI) at the Centre for Invasive Cardiology, Angiology, and Electrotherapy in Pinczow, Poland in the period from January to December 2015 (12 months). Patients were participants in the educational campaign about tobacco addiction "Heart without smoke". At the time of hospital discharge and one and six months after discharge, dedicated nursing staff educated patients about the dangers of smoking and presented possibilities for support in smoking cessation and about tobacco addiction pharmacological treatment, usually in the presence of patient family and/or relatives upon prior patient approval. During hospital discharge (usually 4–6 days after percutaneous coronary intervention [PCI]) a dedicated and trained nurse provided at least 10 min talk with each patient. He/she also called patients on the phone at one and six months and advised them on the benefits of smoking cessation as well as reminding them of the possible options, and invited them to consult the cardiologist at the department if required. The nurses were trained in Krakow by cardiologists from the Institute of Cardiology at Jagiellonian University during a dedicated meeting as well as on-site in the Department in Pinczow before the start of the campaign. Physicians were informed of the campaign and provided an additional talk with each patient at discharge. Additionally, patients were provided with printed educational materials and a campaign dedicated website (www.sercebezdymu.pl) on discharge and a dedicated phone number of the physician whenever they wished to consult their smoking habit. Each discharge letter contained information on the campaign website. A study-dedicated nurse filled out a questionnaire that collected data on the history of smoking, daily tobacco consumption, current tobacco use status, etc. Furthermore, demographics, baseline characteristics, and medical history data were collected from medical history.

In this study, we included 100 patients of both sexes (80% men) with a mean age of 60.5 ± 8.9 years. Demographic and past medical history details are presented in Table 1.

Statistical analysis

The data are presented as mean values and the corresponding standard deviations. Categorical variables were presented as percentages. The Shapiro-Wilk test was used to determine if the quantitative data were normally distributed. Correlation coefficients were calculated to measure the statistical dependence between the measured parameters. We performed

Table 1. Patient baseline demographics and past medical history (n = 100)

Variable	% or mean ± SD
Age	60.5 ± 8.9
Males	80%
Heart failure	14%
Previous MI	8%
Hypertension	51%
Diabetes mellitus	20%
COPD	13%
Overweight with BMI > 25 kg/m²	17%
Obese with BMI > 30 kg/m²	12%
Retirement	58%
Time of active smoking [years]	34.9 ± 11.0
No. of cigarettes per day	20.1 ± 9.9

BMI — body mass index; COPD — chronic obstructive pulmonary disease; MI — myocardial infarction; SD — standard deviation

Table 2. The results of preventive intervention of the "Heart without smoke" educational campaign on smoking cessation in follow-up observation

	Non-smokers	p
At hospital discharge	0	–
One-month after discharge	61	< 0.001
Six-months after discharge	51	0.154

statistical analyses with STATISTICA v12 (StatSoft Inc., Tulsa, OK, USA). A p-value of less than 0.05 was considered to be statistically significant.

RESULTS

In the analysed group, 34 patients tried to quit smoking ineffectively before being admitted to hospital for AMI, and 54 patients quit smoking only for short period of time (less than three months). Among these 5% used chewing gums or transdermal nicotine patches, 6% used electronic cigarettes, 11% various type of medications, and 78% did not use any kind of help in smoking cessation. The majority of the patients (86%) had never asked a doctor or been given advice about possible smoking cessation interventions. After the "Heart without smoke" educational campaign, at one-month follow-up 61 patients had quit smoking and an additional 35 had decreased the number of cigarettes smoked per day. During a six-month follow-up interview, 51 patients did not smoke cigarettes (13 had returned to smoking, three had additionally stopped smoking, one had person died; Table 2). There were no correlations between smoking cessation and gender (p = 0.4; p = 0.2), age (p = 0.8; p = 0.8), duration of smoking (p = 0.8; p = 0.5), and daily cigarette consumption (p = 0.3; p = 0.3) one month and six months after hospital discharge, respectively. Table 3 shows detailed results of using nicotine replacement therapy or electronic cigarettes.

During six-month observation after index hospital stay all patients had stable angina class 1 or 2 and one patient died (cause of death unknown). An additional 10 patients had elective hospitalisations concerning their CVD (elective PCIs). No differences between smokers vs. non-smokers were observed (p > 0.05).

DISCUSSION

Patients after MI are intensely motivated to quit smoking when discharged from hospital. These motivations decrease with the passage of time because they are not sustained in everyday life. In this study, more than half of the patients had participated in an educational campaign about quitting smoking addiction in six-month follow-up after MI. Higher educational level, not living with a smoker, following a multimodal programme or smoking cessation with psychological therapy, and pharmacological treatment are relevant factors for quitting smoking [19]. Some of these factors are independent. Nevertheless, initiation and promotion by medical staff educational programmes increased the smoking cessation rates for hospitalised patients [20, 21]. Although the six-month effectiveness of short medical advice is estimated to be 2–3%, in each visit every smoking patient should be advised to quit smoking by a doctor or other medical staff member, with underlined medical risks related to smoking.

Table 3. The results of using nicotine replacement therapy or electronic cigarettes by patients one and six month after discharge from hospital. In the smoking group there were patients who ineffectively tried to use nicotine replacement therapy or electronic cigarettes

		Smokers	No-smokers	p
One-month after discharge	Pharmacotherapy, gums, nicotine patches	5	2	0.098
	Electronic cigarettes	2	0	
	Nothing	32	59	
Six-months after discharge	Pharmacotherapy, gums nicotine patches	12	2	0.004
	Electronic cigarettes	3	0	
	Nothing	33	49	

Periodic telephone contact to provide a useful guideline for behaviour during the period of cessation, and social support, are especially effective [9]. Meta-analysis results indicate that intensive individual counselling by a physician increases the probability of permanent cessation of smoking by 84%, and by a nurse by 28% [22]. The effect of an educational campaign could increase in cases with cooperation with patients' close family or household members. Park et al. [23] suggested that nurses' contact supporting smoking cessation (phone or SMS messages) reduces the prevalence of smoking and increases the health-promoting lifestyle changes in patients, who undergo PCI. Additionally, personalised interventions are feasible and acceptable by patients [23]. Published studies indicate that the introduction or intensification of smoking bans in public places is associated with reduced number of hospitalisations due to MI [24]. Nowadays there are websites offering smoking cessation support, but there is not much proof for their effectiveness [25]. These programmes could be created by unprofessional persons and characterise a lack of participant control, misunderstanding, and what is worse the promotion of electronic cigarettes. Electronic cigarettes (e-cigarettes) may help people to quit smoking, and probably they are healthier, because they contain nicotine without the vast majority of tobacco chemicals [26]. There is no strong evidence proving the effectiveness of e-cigarettes in quitting cigarettes [27]. In our study, there were two patients who used electronic cigarettes before admission to hospital and a few after MI. The safety of this way to deliver nicotine is under investigation. There are no long-term observations and the side effects are unknown, although electronic cigarettes are less harmful than conventional smoking [26]. Nicotine replacement therapy was not so popular in the analysed group of patients. Probably this is caused by the place of residence (a small city of less than 12,000 residents) and doubts about safety concerning the pharmacotherapy. There is no doubt that smokeless tobacco in comparison to conventional smoking is also associated with a small but statistically significant increased risk of MI and stroke [3]. Pre-discharge standard education alone after MI is not enough in patients with strong, long-term addiction. Small amount of qualified staff, and lack of time and funds leads to abandonment or minimisation of patient education. Introduction of dedicated staff and a constant educational campaign could solve these problems and have an impact on the increased amount of successful smoking cessations. The personalised instructions about how to change behaviour to stop smoking, and follow-up of patients, is crucial in order to achieve permanent and satisfactory results.

Limitations of the study

The results of the present study were obtained at only one centre with no control group for comparison. There were only 100 patients in the study; however, these were real consecutive ones. Additionally, no objective measures of nicotine addiction such as urine cotinine levels were used in the study due to logistic and financial restrictions. The degree of addiction, commonly assessed by the Fagerstrom test [28], was not assessed, which could expand the interpretation of obtained results.

CONCLUSIONS

Constant education of patients after MI was an effective method for smoking cessation in over 50% of smokers six months after MI. The majority of smokers did not receive any form of advice on smoking cessation before the index hospitalisation for MI. All patients with CVD, especially after MI, should receive support to prevent a subsequent event, within the secondary preventive interventions. The role of nursing staff in the support the maintenance of smoking cessation decisions is important and essential in daily practice for all healthcare providers.

Conflict of interest: *none declared*

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