Awareness of cardiovascular risk factors in ambulatory cardiology patients

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Abstract: Cardiovascular diseases (CVD) are the leading cause of mortality. The majority of CVD risk factors are modifiable and controllable so the knowledge of them might prevent circulatory diseases development and improve already diagnosed CVD outcomes. The aim of the study was to assess the awareness of risk factors for CVD in ambulatory patients of cardiology offices. A specially designed questionnaire was used by trained physicians in a structured technique of face-to-face interview in 284 consecutive patients (men — 47.9%, aged 64.1 ± 11.2 years). As many as 6.3% of the study participants did not name any CVD risk factor, whereas only 7.4% of patients knew at least 3 of them. Smoking and high cholesterol were best recognized (33.1% and 27.4%, respectively) while the least often quoted old age was identified only by 2.5% of the individuals. The average number of the listed CVD risk factors equaled 1.38 ± 0.77. In the multiple regression analysis the factors significantly associated with knowledge of CVD risk factors comprised the level of education (b = 0.55, p <0.0001) and age (b = −0.02, p <0.0001). The patients with family history of CVD diseases were more often aware of the fact that family history of CVD is a risk factor for CVD as compared to individuals with no relatives affected by CVD (21.9% vs 10.1%, p = 0.0061). To the contrary, respondents with hypercholesterolemia

less often knew that dyslipidemia is a CVD risk factor than patients with normal cholesterol levels (24.1% vs 41.1%, p = 0.0108). In conclusion, the awareness of cardiovascular risk factors in ambulatory cardiology patients is very low. The perception of CVD risk factors is affected by the level of education and age.

Key words: cardiovascular risk factors, awareness, knowledge, cardiovascular disease, level of education, questionnaires.

Introduction

Cardiovascular diseases (CVD) are the leading cause of mortality in the Western countries and Poland [1, 2]. They also contribute to mass disability and have huge economic repercussions [3]. CVD prevention strategies have been proven to be very efficient in randomized controlled trials but unfortunately the gap between state-of-the-art knowledge and its implementation in clinical practice remains wide what was vividly demonstrated in surveys such as EUROASPIRE III [4].

The majority of CVD risk factors are modifiable and controllable so the awareness of them might stimulate the change in health behavior of patients, it could potentially result in earlier presentation to medical care and eventually improve CVD outcomes [5].

Only single studies assessing the knowledge of various groups of Poles about CVD are available in the literature [6, 7]. None of them estimated the level of awareness of CVD risk factors in ambulatory cardiology patients. Such cognizance is crucial for the diseased to understand the endangerments associated with CVD and the goals of the therapy.

The results of the research will throw light on patients' perception of CVD, their educational needs and will help to improve the communication between hundreds of thousands of Polish patients with CVD and their cardiologists.

The aim of the study was to assess the awareness of CVD risk factors in ambulatory patients of cardiology offices.

Material and methods

The study was conducted at 2 cardiologists' offices in ambulatory patients in separate locations of less than 30 thousand inhabitants. A specially designed questionnaire was used by trained physicians in a structured technique of face-to-face interview during planned visits of consecutive cardiology offices' patients who consented to participate in the study. Only 2 patients refused to participate in the survey: one due to severe hearing problems markedly hindering the conversation and the other one because of lack of time associated with professional duties on the day of the visit.

In the first part of the survey the participants were acquainted by the physicians with the adopted definition of a risk factor for CVD: "measurable characteristic (a disease, abnormal laboratory result or a lifestyle aspect etc.) that is causally associated with an increased cardiovascular/circulatory diseases frequency and their progression" and were subsequently asked to name all the known risk factors for CVD [8]. Then, demographic data were collected including the level of education, weight, height (for the calculation of body mass

index — BMI), physical activity (regular — at least 3 times a week for 30 minutes or lack of physical activity), the occurrence of risk factors for CVD and diagnosed atherosclerotic disease based on the interview and medical documentation [1]. Knowledge of CVD risk factors was assessed in this study as a continuous variable, ranged 0–9, with one point for each named CVD risk factor (Table 2).

Statistical analysis was performed with SAS System 9.1 (SAS Institute Inc., Cary, North Carolina, USA). Data are presented as mean (± standard deviation) for continuous variables and as absolute frequencies or relative percentages for categorical variables.

For assessment of the cross-sectional association of single predictors with cardiovascular disease knowledge, we applied the General Linear Model (PROC GLM procedure, as incorporated in the SAS software). In the multiple regression analysis factors with p value ≤0.25 were taken into the model to determine the factors that are independently associated with CVD knowledge. In the last part we have investigated the relation between the individual characteristics (the presence of CVD risk factors) and the knowledge of specific risk factor contribution to CVD using Chi-square test. Statistical significance was considered when p value <0.05.

This study was performed in compliance with the Declaration of Helsinki.

Results

Two hundred eighty four consecutive patients (136 men — 47.9%) participated in the survey. Clinical characteristics are presented in Table 1. The patients groups of the two offices did not differ significantly regarding their numbers (140 vs 144) and clinical variables.

Table 1. Clinical characteristics of the study group (n = 284).

Demographic and clinical features	Frequencies / values
Male gender	47.9% (n = 136)
Age [years]	64.1 ± 11.2
Diagnosed atherosclerotic disease	38.0% (n = 108)
Hypertension	81.3% (n = 231)
Diabetes	28.5% (n = 81)
Smoking — previously or currently	42.9% (n = 122)
Hypercholesterolemia	80.2% (n = 228)
Obesity (body mass index — BMI ≥30 kg/m²)	33.8% (n = 96)
Positive family history of CVD	36.6% (n = 104)
Lack of physical activity	58.8% (n = 167)
Education: Primary and vocational education 　　　　　　Secondary education 　　　　　　Higher education	60.9% (n = 173) 28.9% (n = 82) 10.2% (n = 29)

As many as 6.3% of the study participants did not name any CVD risk factor, whereas only 7.4% of patients knew at least 3 of them (maximally 5). Smoking and high cholesterol were best recognized as risk factors for CVD (33.1% and 27.4%, respectively) while the least often quoted old age was identified only by 2.5% of the individuals (Table 2). The average number of the listed CV risk factors reached 1.38 ± 0.77.

Table 2. Awareness of the risk factors for cardiovascular diseases in the whole study groups and subgroups of different levels of education.

	Total (n = 284)	Primary and vocational education 60.9% (n = 173)	Secondary education 28.9% (n = 82)	Higher education 10.2% (n = 29)
Hypertension	9.2% (n = 26)	6.9% (n = 12)	11.0% (n = 9)	17.2% (n = 5)
Diabetes	10.9% (n = 31)	7.5% (n = 13)	13.4% (n = 11)	24.1% (n = 7)
Smoking	33.1% (n = 94)	24.8% (n = 43)	45.1% (n = 37)	55.2% (n = 14)
High cholesterol	27.4% (n = 78)	23.1% (n = 40)	34.1% (n = 28)	34.4% (n = 10)
Obesity	12.0% (n = 34)	11.0% (n = 19)	12.1% (n = 10)	17.2% (n = 5)
Stress	13.3% (n = 38)	10.4% (n = 18)	17.1% (n = 14)	20.6% (n = 6)
Positive family history of CVD	14.4% (n = 41)	12.1% (n = 21)	15.8% (n = 13)	24.1% (n = 7)
Lack of physical activity	15.5% (n = 44)	13.9% (n = 24)	14.6% (n = 12)	27.6% (n = 8)
Old age	2.5% (n = 7)	1.2% (n = 2)	2.4% (n = 2)	10.3% (n = 3)

In the univariate analysis the variables significantly associated with the knowledge of CVD risk factors included age, the level of education, arterial hypertension, family history of CVD and the lack of physical activity. In the multivariate analysis the factors independently associated with the risk factors for CVD comprised the educational level (b = 0.55, p <0.0001) and age (b = −0.02, p <0.0001) (Table 3).

Table 3. Determinants of cardiovascular disease knowledge: single-predictor and multiple-predictor linear regression analyses.

Single-predictor analysis		
Determinant	Regression coefficients (SE)	p
Age (year)	−0.03 (0.004)	<0.0001
Gender (0 — male, 1 — female)	0.07 (0.08)	0.35
Education level (0 — primary; 1 — secondary; 2 — tertiary)	0.57 (0.06)	<0.0001
Obesity (1 — yes; 0 — no)	−0.01 (0.12)	0.90

Atherosclerosis (1 — yes; 0 — no)	−0.01 (0.10)	0.99
Hypertension (1 — yes; 0 — no)	−0.25 (0.11)	0.03
Diabetes (1 — yes; 0 — no)	−0.06 (0.11)	0.51
Smoking (1 — yes; 0 — no)	0.02 (0.09)	0.80
Hypercholesterolemia (1 — yes; 0 — no)	0.06 (0.11)	0.60
Family history of CVD (1 — yes; 0 — no)	0.22 (0.09)	0.017
Lack of physical activity (1 — yes; 0 — no)	−0.29 (0.09)	0.001
Multiple-predictor analysis		
Determinant	Regression coefficients (SE)	p
Age (year)	−0.02 (0.003)	<0.0001
Education level (0 — primary; 1 — secondary; 2 — tertiary)	0.55 (0.05)	<0.0001
Hypertension (1 — yes; 0 — no)	0.02 (0.11)	0.82
Lack of physical activity (1 — yes; 0 — no)	−0.07 (0.08)	0.36
Family history of CVD (1 — yes; 0 — no)	0.14 (0.08)	0.053

The patients with family history of CVD diseases were more often aware of the fact that family history of CVD is a risk factor for CVD than individuals with no relatives affected by CVD (21.9% vs 10.1%, p = 0.0061). To the contrary, respondents with hypercholesterolemia less often knew that dyslipidemia is a risk factor CVD than patients with normal cholesterol levels (24.1% vs 41.1%, p = 0.0108). No associations were observed regarding hypertension, diabetes, smoking, obesity, stress, lack of physical activity and old age.

Discussion

The results of the study disclose a dramatically low level of awareness of CVD risk factors in ambulatory patients of cardiology offices. It is especially important since the incidence of risk factors and CVD in this group of individuals naturally exceeds their occurrence in general population [9].

Data from European epidemiological studies from recent years indicate improvement in the control of some modifiable risk factors like hypertension and dyslipidemia or decrease in smoking prevalence leading to reduced CVD risk assessed i.a. by the Framingham and European Systemic Coronary Risk Evaluation (SCORE) systems, which can be perceived as success of different community prevention programs, communication policies and extensive work of numerous scientific associations [10, 11]. Interestingly, in Poland neither advances in methods of treatment of coronary artery disease nor changes in exposure to main cardiovascular risk factors can fully explain the negative trends in CVD mortality. The influence of psychosocial aspects is considered but low level of awareness of CVD risk factors and cardiovascular prevention methods and their implementation as well as poor compliance definitely play a role [12–15].

Poor patients' knowledge about CVD and their risk factors has been reported in previous surveys from various continents [6, 7, 16–22]. In the studies from Canada, Northern Ireland, Pakistan and Jordan individuals at higher socioeconomic levels had better CVD knowledge scores what is consistent with our survey results in which educational level was applied as a socioeconomic determinant [16–18, 23]. We have also stated poor association of age with lower awareness of CVD risk factors what was observed i.a. in the aforementioned study of Potvin *et al.* [18]. Surprisingly, no previously diagnosed atherosclerotic disease affected the knowledge of CVD, what is opposed to the observation of Tchicaya and colleagues in 4,500 patients undergoing coronary angiography [24].

Noteworthy, in studies on CVD knowledge a few other variables, involving i.a. lifestyle aspects, differed groups of patients of various CVD awareness level. Positive CVD family history made patients more aware of CVD in the paper by Al Hamarneh *et al.* like in our survey, and in the study Thanavaro *et al.* caused that women chose healthier lifestyle [18, 25]. Petricek and colleagues reported that patients who do not pay attention to their diet could list fewer CVD risk factors [26]. To the contrary, in our study neither hypertension nor diabetes did, what is alarming considering the impact on prognosis and CVD complications of those diseases [1]. Such devastating results were also presented in the paper of Mazalin and colleagues who concluded that the actual presence of CVD risk factors in participants did not appear to alter their perceptions of risk compared to participants without CVD risk factors [27].

Our study and the cited papers draw attention to underestimated aspects of CVD treatment process including patient's awareness of the disease and the knowledge of basic facts about CVD which have been shown to affect their motivation for therapy and compliance [1]. One of the drawbacks of the study was the small group size but consecutive recruitment made the group highly representative for the typical ambulatory cardiology offices. Another defect is a limited number of analyzed socioeconomic variables and a lack of assessment of other aspects of patients' knowledge about CVD prevention and treatment. Nevertheless, the obtained results unveil the disturbing extent of the ignorance of cardiologic patients which should be investigated on larger scale in further research.

Summing up, public's lack of CVD risk factors knowledge is a global and unappreciated issue. A good illustration for this situation is the study on the perception of CVD risk factors among medical students in Croatia showing highly insufficient knowledge of students not only on their enrolment day but at graduating from university [28]. No data of Polish contemporaries are available but there are not premises indicating their proficiency. Our survey and majority of the cited papers show the demand of strenuous effort and new strategies in improving general, not only cardiology patients', awareness of CVD using novel tools and at earlier phases of education [29, 30].

In conclusion, the awareness of cardiovascular risk factors in ambulatory cardiology patients is very low. The perception of CVD risk factors is affected by the level of education and age.

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Conflict of interest

None declared.

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