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The prevalence of risk factors for cardiovascular diseases among Polish surgical patients over 65 years

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Background: Cardiovascular diseases (CVDs) are the leading cause of mortality among adults in Poland. A number of risk factors have significant influence on CVD incidence. Early identification of risk factors related to our lifestyle facilitates taking proper actions aiming at the reduction of their negative impact on health.

Aim: The aim of the study was to compare the prevalence of CVD risk factors between patients aged over 65 years and patients of other age groups in surgical wards.

Material and methods: The study was conducted for assessment and finding the distribution of major risk factors of CVD among 420 patients aged 18–84 years who were hospitalized in surgical wards. Interview, anthropometric measurements, blood pressure, and fasting blood tests for biochemical analysis were conducted in all subjects. Statistical analysis of the material was performed using Student's *t*-test, chi-square test, Fisher's exact test, Mann–Whitney *U*-test, and analysis of variance.

Results: While abdominal obesity (83.3%), overweight and obesity (68%), hypertension (65.1%), hypercholesterolemia (33.3%), and low level of physical activity (29.1%) were the most common CVD risk factors among patients over 65 years old, abdominal obesity (36.2%), overweight and obesity (36.1%), and current smoking were the most common CVD risk factors among patients up to the age of 35. In the age group over 65, the least prevalent risk factors for CVD were diabetes mellitus (14.8%), depressive episodes (13.6%), abuse of alcohol (11.4%), and smoking (7.8%). In the group under 35 years, we have not reported any cases of hypercholesterolemia and a lesser number of patients suffered from diabetes and HTN.

Conclusion: Distribution of the major risk factors for CVD is quite high in the adult population, especially in the age group over 65, which can result in serious problems of health and increased rates of chronic diseases, especially CVDs.

Keywords: cardiovascular diseases, risk factors, elderly

Introduction

Cardiovascular diseases (CVDs), due to their prevalence and significant contribution to overall mortality, pose a significant health problem, particularly in developing and developed countries.[1,2] According to Eurostat data from 2010, a standardized mortality rate due to CVDs for 28 countries of the European Union was 432.3 per 100,000 inhabitants and was 35% higher for men (507.7) than for women (372.2).[3] Meanwhile, in the US, the mortality rate from CVD in 2010 amounted to 236.6 per 100,000 inhabitants and fell by 8.8% compared to 2007.[4]

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One of the most nonmodifiable CVD risk factors is age. The percentage rate of people suffering from CVDs, including hypertension (HTN), coronary heart disease, heart failure, and stroke, increases with age.[5]

Unfortunately, population aging is nowadays a global phenomenon, concerning all regions and nearly all countries of the world. It occurs as a result of decrease in the number of new births and longer average life expectancy which is a consequence of improved care for the elderly, especially in developed countries. In the Member States of the European Union, 18.2% of the population consists of people aged over 65 years, and the dependency ratio measuring the relationship between the number of elderly people and the number of people of working age is 27.5%.[3]

In the wake of population aging in many countries, it seems to be important to identify modifiable risk factors for CVDs in patients over 65 years, followed by the introduction of preventive measures that will reduce the risks of developing CVDs or reduce the development of diseases and, thus, improve the quality of patients' lives.

The aim of the study was to compare the prevalence of CVD risk factors between patients aged over 65 years and patients of other age groups in the surgical wards (under 35 years, 35–49 years, and 50–64 years).

Materials and methods

The study included 420 patients aged 18–84 years, hospitalized in four surgical wards from September 2013 till May 2014. The patients enrolled in the study project were the ones who on the examination day were in the hospital awaiting a surgery and the diagnosed disease did not affect their lifestyle significantly in the period of 3 months prior to hospitalization.

The study excluded patients who were diagnosed with cancer or active infectious disease, and those who were subjected to surgery during the 3 months preceding the survey.

All participants of the study were informed of the study purpose, its course, and the possibility of withdrawal from participation at every stage of the study, and they also signed their informed, written consent to participate in the study.

The research project was approved by the Bioethics Committee of Wroclaw Medical University no KB 566/2013.

The diagnostic survey method was applied in this study using the author's questionnaire and standardized questionnaires, that is, International Physical Activity Questionnaire (IPAQ),[6] Beck Depression Inventory (BDI),[7] Menu Scoring method by Starzyńska,[8] Fagerstrom Test for Nicotine Dependence,[9] Michigan Alcoholism Screening Test (MAST),[10] Finnish Diabetes Risk Score (FINDRISC),[11] Inventory to Measure Coping Strategies with Stress (Mini-COPE),[12] and Systematic Coronary Risk Evaluation (SCORE).[13]

Blood pressure (BP) was measured in accordance with the current guidelines recommended by the Polish Society of Hypertension and the College of General Practitioners in 2008 with the use of OMROM M6 Comfort BP monitor (Omron Healthcare, Kyoto, Japan).[14,15] The mean of two BP recordings was used in the analysis.

On the examination day, BP values higher than 140/90 mmHg were treated as increased, while the group of patients with HTN comprised those with documented diagnosis of HTN or taking medication for HTN.

Glucose (GL) and total cholesterol (TC) were measured in the first blood samples taken in the morning after a minimum of 8 hours fasting using CardioChek Brand Analyzers (PTS Panels Company, PTS Diagnostics, Indianapolis, IN, USA). Abnormal level of TC was established with the value >190 mg/dL, according to the European guidelines on CVD prevention in clinical practice (version 2012).[16] The patients defined as suffering from lipid disorders were those with documented disease or taking drugs to lower the TC levels in blood. The established value for abnormal level of GL was >100 mg/dL in accordance with the guidelines on diabetes management in clinical practice (version 2014).[17] The patients defined as suffering from diabetes mellitus (DM) were those with documented disease or taking medication to lower GL levels in blood.

The body mass index (BMI) was calculated in kg/m^2 from the weight and height, measured with medical scales ZMP RADWAG model T 6496 (ZMP RADWAG Company, Radom, Poland), in accordance with the current guidelines of the World Health Organization,[18] with the participants wearing only pajamas (without shoes). Obesity was defined as a BMI of 30 kg/m^2 or higher.

Waist circumference (WC) was measured with an insertion tape. Waist measurement was taken from the midpoint between the iliac crest and the lower ribs measured at the sides. Abdominal obesity was established at a level of WC ≥94 cm in men and ≥80 cm in women in accordance with International Diabetes Federation criteria for European population.[19]

Author's questionnaire was a survey of own authorship, which included questions about sociodemographic data, that is, age, sex, marital status, place of residence, education, income per person in the family, and socioeconomic status.

Diet was evaluated with the use of Menu Scoring method by Starzyńska. It is a qualitative assessment of the planned diet, and refers to the amount and composition of various meals and the frequency of consumption. We assessed the

diet on the basis of the sum of points obtained by the participants for their answers. A score lower than 12 means that the diet is improper.

The IPAQ-short form was used to assess participants' physical activity during the 7 days before hospitalization in terms of the frequency (d/wk), duration (min/d or h/d), and intensity (sedentary, light, moderate, or vigorous) of physical activity. According to the IPAQ scoring protocol, responses were converted to Metabolic Equivalent Task minutes per week (MET-min/wk): total minutes spent over last 7 days on light, moderate, and vigorous activities were multiplied by 3.3, 4.0, and 8.0, respectively, to obtain the MET scores for each activity level. Physical activity levels were also classified into three categories as low, moderate, and high, according to the scoring system provided by IPAQ.

The Fagerstrom Test for Nicotine Dependence is the questionnaire method to examine nicotine addiction. The degree of nicotine addiction is assessed in three categories as low (0–4 points), moderate (5 points), and high (6–10 points).

The FINDRISC is a simple, fast, cheap, noninvasive, and reliable tool, which allows assessment of the risk of developing diabetes in the next 10 years. It is rated as follows: <7 points – low: one person in 100 will get sick; 7–11 points – slightly increased: one person in 25 will get sick; 12–14 points – slight/medium: one person in six will get sick; 15–20 points – high/increased: one person in three will get sick; >20 points – very high/very much increased: one in two persons will get sick.

The MAST is a fast screening tool consisting of 25 questions designed to detect alcoholism in subjects. Obtaining ≥5 points proves compliance with the examination criteria for alcoholism, 4 points indicates that probably the subject examined is an alcoholic, and ≤3 points means probably the subject examined is not an alcoholic.

The BDI is a self-report inventory for measuring the severity of depression. Obtaining from 0 to 11 points demonstrates lack of depression, 12–26 points shows mild depression, 27–49 points indicates moderately severe depression, and 50–63 points denotes very severe depression.

The SCORE system has been used to calculate the risk of death due to cardiovascular incidents within the next 10 years. It is based on specially designed tables, which compare information such as sex, age, cigarette addiction, TC level, and systolic BP. Based on the obtained results, patients are assigned to one of the risk groups: significantly increased (≥10%), increased (5%–9%), moderate (1%–4%), and low (0%). People with diabetes and previously diagnosed CVD belong to the group of increased risk.

In order to determine strategies to cope with stress, the Polish version of the inventory Mini-COPE was applied in the study (adopted by Zygfryd Juczyński and Nina Ogińska-Bulik). Inventory Mini-COPE consists of 28 statements, which are divided into 14 categories of coping with stress: active coping, planning, positive reevaluation, acceptance, sense of humor, turn to religion, seeking emotional support, seeking instrumental support, dealing with something different, denial, shock, use of psychoactive substances, cessation, and self-blame.

All the obtained data were entered in Microsoft Office Excel 2010, and statistical analysis of the parameters studied was performed with the use of STATISTICA software Version 10.0 (StatSoft Inc.,Tulsa, OK, USA) as well as Student's *t*-distribution test, chi-square test, Fisher's exact test, Mann–Whitney *U*-test, and analysis of variance. The level of significance was set at $P<0.05$.

Results

The study included 420 patients hospitalized in four surgical wards, that is, Department of Urology (17.9%), Department of General Surgery (35.3%), Department of Orthopedics and Traumatology of the Locomotor System (20.1%), and Department of Neurosurgery (26.7%). The youngest patient was 18 years old and the oldest was 84 years old. The mean age was 52.4±16.2 years.

In the study, 19.8% of patients were aged below 35 years, 16.7% were in the age range of 35–49 years, 39% were aged between 50 and 64 years, and 24.5% of patients were older than 65 years. The detailed sociodemographic data are presented in Table 1.

Analysis of the study material showed that on the examination day, 28% of patients had BP ≥140/90 mmHg. It occurred more often in patients over 65 years of age (38.8%) than in those belonging to the age group below 35 years (13.3%) ($P<0.001$) and between 35 and 49 years (24.3%) ($P=0.046$). Also, HTN was diagnosed significantly more often in those of age group 65 years and above (65.1%) than in persons under 50 years of age ($P<0.001$) (Table 2).

Impaired fasting glycemia (≥100 mg/dL) was observed on the examination day in 19.5% of patients, significantly more often in patients over 65 years of age (28.2%) than in those of age group below 35 years (4.8%) ($P<0.001$) and between 35 and 49 years (8.6%) ($P=0.002$). Among the patients, 11.6% had diabetes type 2. The highest percentage of persons suffering from diabetes was in the age group 50–64 years (18.3%), and this difference was statistically significant in relation to the younger age groups ($P<0.005$).

Table 1 Sociodemographic data with reference to age

Variable	Age group, years				Test result
	1) Up to 35	2) From 35 to 49	3) From 50 to 64	4) 65 and above	
Sex	n=83	n=70	n=164	n=103	*P*=0.565
Female	40 (48.19%)	38 (54.29%)	74 (45.12%)	53 (51.46%)	
Male	43 (51.81%)	32 (45.71%)	90 (54.88%)	50 (48.54%)	
Marital status	n=83	n=70	n=164	n=103	***P*<0.005**
Single	56 (67.47%)	23 (32.86%)	23 (14.11%)	4 (3.88%)	
Married	26 (31.33%)	44 (62.86)	130 (79.75%)	71 (68.93%)	
Widow/widower	1 (1.2%)	3 (4.29%)	10 (6.13%)	28 (27.18%)	
Place of residence	n=83	n=70	n=164	n=103	***P*>0.05**
Village	20 (24.1%)	21 (30%)	45 (27.44%)	22 (21.36%)	
Town up to 10,000 residents	5 (6.02%)	3 (4.29%)	11 (6.71%)	4 (3.88%)	
City from 10,000 to 100,000 residents	11 (13.25%)	10 (14.29%)	34 (20.73%)	34 (33.01%)	
City >100,000 residents	47 (56.63%)	36 (51.43%)	74 (45.12%)	43 (41.75%)	
Education	n=83	n=70	n=164	n=103	***P*<0.001**
Basic	4 (4.82%)	4 (5.71%)	10 (6.1%)	17 (16.67%)	
Basic vocational education	7 (8.43%)	16 (22.86%)	32 (19.51%)	21 (20.59%)	
Secondary vocational	12 (14.46%)	14 (20%)	61 (37.2%)	24 (23.53%)	
High school	27 (32.53%)	7 (10%)	23 (14.02%)	17 (16.67%)	
Postsecondary education	1 (1.2%)	3 (4.29%)	3 (1.83%)	5 (4.9%)	
Bachelor degree	7 (8.43%)	1 (1.43%)	1 (0.6%)	0 (0%)	
Master degree	25 (30.12%)	25 (35.71%)	34 (20.73%)	18 (17.65%)	

Note: Significant differences (*P*<0.05) are shown in bold. Data presented as n (%).

However, in patients older than 65 years, 14.8% suffered from DM.

Analysis of the study material showed that on the examination day, higher levels of TC (>190 mg/dL) occurred in 30% of patients, significantly more often in patients between 35 and 49 years of age and in those aged between 50 and 64 years than in those below 35 years (*P*<0.001 in both cases) and over 65 years (*P*=0.025 and *P*=0.012). It was also found that every third patient in the age group over 65 years was being treated for lipid disorders.

Analysis of the study material showed that 38% of patients were overweight and 23.8% were characterized

Table 2 Prevalence of individual CVD risk factors in patients from different age groups

Variable	Age group, years				Test result
	1) Up to 35 n (%)	2) From 35 to 49 n (%)	3) From 50 to 64 n (%)	4) 65 and above n (%)	
	n=83	n=70	n=164	n=103	
BP >140/90 mmHg*	11 (13.2%)	17 (24.3%)	51 (31.1%)	40 (38.8%)	***P*=0.001**
Hypertension	3 (3.6%)	15 (21.4%)	92 (56.1%)	67 (65.1%)	***P*<0.001**
GL >100 mg/dL*	4 (4.8%)	6 (8.6%)	43 (26.2%)	29 (28.2%)	***P*<0.001**
Diabetes	1 (1.2%)	3 (4.3%)	30 (18.3%)	15 (14.6%)	***P*<0.001**
TC >190 mg/dL*	5 (6.0%)	29 (41.4%)	66 (40.2%)	26 (25.2%)	***P*<0.001**
Hypercholesterolemia	0 (0.0%)	7 (10%)	46 (28.0%)	34 (33%)	***P*<0.001**
Excessive weight	30 (36.1%)	36 (51.4%)	126 (76.8%)	70 (68%)	***P*<0.001**
Overweight	20 (24.1%)	21 (30%)	80 (48.8%)	39 (37.9%)	***P*=0.001**
Obesity	10 (12%)	15 (21.4%)	46 (28.1%)	31 (30%)	***P*=0.001**
Abdominal obesity	29 (36.2%)	43 (63.2%)	121 (79.6%)	75 (83.3%)	***P*<0.001**
Current smoking	25 (30.1%)	16 (22.9%)	35 (21.3%)	8 (7.8%)	***P*=0.001**
Abuse alcohol	5 (7.6%)	6 (16.7%)	14 (15%)	5 (11.4%)	*P*=0.808
Improper diet	77 (92.8%)	68 (97.1%)	154 (93.9%)	98 (95.1%)	*P*=0.482
Low level of activity	14 (16.9%)	19 (27.1%)	36 (22%)	30 (29.1%)	*P*=0.206
Depression	5 (6%)	4 (5.7%)	13 (7.9%)	16 (15.5%)	*P*=0.192

Notes: *Blood test results on the examination day. Significant differences (*P*<0.05) are shown in bold.
Abbreviations: BP, blood pressure; CVD, cardiovascular disease; GL, glucose; TC, total cholesterol.

Table 3 Basic statistics of physical activity in subgroups of patients differing in age

Variable	Age group, years				Test result
	1) Up to 35	2) From 35 to 49	3) From 50 to 64	4) 65 and above	
Physical activity	n=83	n=70	n=164	n=103	***P*=0.016**
M ± SD	4,532±5,135	4,406±6,230	3,707±4,501	2,509±3,703	

Notes: Significant differences ($P<0.05$) are shown in bold. Data shown as mean ± standard deviation.
Abbreviations: M, mean; SD, standard deviation.

by varying degrees of obesity. In the age group >65 years, 37.1% were overweight, while 30.9% suffered from obesity. Patients aged over 65 years were characterized significantly more often by excessive body weight (BMI >25) ($P<0.001$) and abdominal obesity ($P<0.001$) than patients under the age of 50 years.

The Menu Scoring method by Starzyńska contributed to observations that the diet of 94.5% of patients was bad and not suitable for improvement of health. There were no statistically significant differences in nutrition between the studied age groups. However, given the average number of points obtained in the examination, it can be concluded that a person aged under 35 obtained higher number of points (10.2 points) significantly more often than other patients (from 35 to 49 years: 8.2 points vs 50–64 years: 8.9 points vs over 65 years: 8.4 points) ($P=0.017$).

Analysis of the study material showed that 12.6% of patients met the criteria for alcoholism according to the MAST test (obtained 5 or more points). In the age group 65 and over, 11.4% of the patients abused alcohol, but the differences between the studied age groups were not statistically significant.

It was also demonstrated that 29.1% of patients over 65 years of age were characterized by a low level of physical activity. People older than 65 years obtained significantly lower mean number of points in the IPAQ questionnaire than other patients ($P=0.016$) (Tables 3 and 4).

Analysis of the study material shows that about 20% of the respondents actively smoked and 21% were exposed to passive smoking. In the oldest age group, only 7.8% of respondents smoked tobacco; in contrast, in the youngest group, >30% of respondents smoked tobacco. In the other age groups, this percentage was found to be approximately 20%. Statistical analysis showed that the difference between the studied age ranges was statistically significant ($P=0.001$).

The mean number of points obtained by smokers in the Fagerstrom test evaluating the degree of nicotine dependence was 4.09±2.41. In the group of smokers, there were no statistically significant differences in the degree of nicotine dependence in reference to the age range.

A vast majority of patients (91.7%) had no symptoms of depression at the time of examination. In contrast, symptoms of mild depression were observed in 8.3% of all respondents; however, in the age group >65 years, 13.6% of patients were diagnosed with symptoms of mild depression. Analysis of the study material obtained from the BDI revealed that people aged 65 years and above obtained higher number of points than the respondents in other age groups ($P<0.001$).

Analysis of the study material showed that most often in situations of severe stress, patients turn to methods of finding emotional support (2.41±0.66 points) and actively coping with stress (2.38±0.59 points). In contrast, the least likely in difficult situations is the use of psychoactive substances (0.13±0.41 points). In difficult situations, people over 65 years seldom use the methods of actively coping with stress, such as planning. These individuals are less likely to reveal their emotions and more likely to take psychoactive substances, and less frequently approach difficult issues with a sense of humor, than those aged <50 years. However, they are significantly more likely to turn to religion than younger people (under the age of 50).

Analysis of the study material showed that people over the age of 65 were significantly more frequently at higher risk of developing diabetes according to the FINDRISC scale (obtained from 15 to 20 points, ie, one in three persons will develop diabetes) and dying from cardiovascular incidents within 10 years (≥10%) according to the SCORE scale. However, one of the criteria taken into account in the above scales is age, and therefore, automatically, patients over 65 years scored more points than patients under the age 65.

Table 4 Results of multiple comparisons with post hoc test of LSD

Age group	1 versus 2	1 versus 3	1 versus 4	2 versus 3	2 versus 4	3 versus 4
	P=0.871	*P*=0.201	***P*=0.004**	*P*=0.307	***P*=0.011**	***P*=0.047**

Notes: Significant differences ($P<0.05$) are shown in bold. The age groups are defined as: 1, <35 years; 2, 35–49 years; 3, 50–64 years; 4, ≥65 years.
Abbreviation: LSD, least significant difference.

Discussion

CVDs, due to their prevalence and because they make a significant contribution to overall mortality, constitute a serious problem for the entire health sector. Early identification of factors predisposing to the development of these diseases can reduce the number of new cases and, thus, reduce the number of premature deaths, as well as the costs related to the treatment and loss of full capacity for an active independent life.

A report from the New York City Department of Health showed that 42% of the population aged over 65 years suffers from HTN.[20] Also, in Taiwan, People's Republic of China, and India, similar proportions of the elderly suffer from HTN.[21,22] Our own study showed that 65% of patients in this age group are treated for HTN. A similar proportion of patients in the elderly population was also reported to have HTN by other authors.[23–28] Studies carried out by Ricci et al[29] and Wu et al[26] among the inhabitants of Russia and South Africa show that about 80% of respondents aged 65 and above suffer from HTN. Such a high percentage of people having HTN is a serious problem for the entire health care sector, as the high BP values lead to increase in mortality due to CVD.[30]

According to the studies conducted in Italy, people with diabetes have a 61% higher risk of death from CVD than those who do not suffer from diabetes.[31] In this study, 14.8% of patients aged over 65 years were diagnosed with diabetes. A similar proportion of patients with DM was observed among the elderly in many countries.[20,21,24,25,27,29,32–34] In contrast, the studies carried out by Salas et al[23] and Schneiderman et al[35] show that the percentage is much higher and ranges from 38.7% in the age group of 60–69 years to 48.6% in those aged 70 years and above.

Higher level of TC is one of the most important risk factors for developing CVD and its increasing mortality.[36] This study confirmed that every third patient in the age group over 65 years is being treated for lipid disorders,[20] whereas many authors showed that about 50% of the elderly suffer from hypercholesterolemia.[21,25,33,37]

A meta-analysis of 57 prospective studies showed that people with first-degree obesity die 2–4 years earlier, while those with third-degree obesity die on average 8–10 years earlier.[38] Among elderly inhabitants of India, only 4.6% are characterized by BMI >30.[26] A similar percentage of elderly people with obesity live in Taiwan and Ghana.[21,26] According to a study conducted among older residents of Warsaw, the figure amounts to 11.5%.[39] However, many authors reported higher values (approximately 20% of people aged over 65 years are characterized by BMI >30).[20,24,26,28,32] In the present study, however, this percentage was even higher (about 30%) and similar to the results obtained by Ricci et al,[29] Zatońska et al,[33] and Wu et al[26] among the Russian population. Among Germans >60 years of age, the percentage of obese people is about 45%.[34] In contrast, in Malaysia and among Hispanics living in the US, about 60% of people aged over 60 years were characterized by obesity.[25,40]

Numerous studies conducted among people aged 65–74 years revealed the relationship between WC and a higher risk of death due to CVD.[41,42] In the studies by Ramsay et al[32] and Ricci et al,[29] only 40% of older people are characterized by abdominal obesity, but this is related to the different evaluation criteria (WC >102 cm for men and WC >88 cm for women). In contrast, results of this study confirmed the data obtained by other authors showing that more than three-quarters of respondents aged over 60 years had abdominal obesity.[23,24]

In this study, the percentage of people with abdominal obesity was much higher among patients aged 65 and above than in younger age groups. This is an extremely alarming phenomenon and it requires decisive action to be taken. Therefore, prevention of obesity and establishing proper eating habits not only among the elderly but also among the young people should be one of the most important preventive measures by the doctors and the entire therapeutic team.

This study confirmed the data obtained by Tokarz et al[43] that approximately 90% of people aged over 60 years are characterized by improper eating habits. The most common nutritional mistakes among the elderly are not taking varied diet, and eating small amounts of fruits and vegetables and also food containing milk and its products.[43]

In the present study, it was demonstrated that 29.1% of patients in the age group over 65 years are characterized by a low level of physical activity. Similar data were obtained by Biernat and Tomaszewski[39,44] in their study on the residents of Warsaw aged 60–69 years, Rodríguez-Sánchez et al[28] on the inhabitants of Salamanca, and Wu et al[26] on the inhabitants of Ghana. In contrast, Piątkowska's study conducted on a representative group of Poles, Völzke et al[34] examining Germans in the years 2008–2012, and the study by Wu et al[21,26] conducted in Taiwan and among the inhabitants of India and Mexico show that about half of the respondents aged over 60 years are characterized by a low level of physical activity.[45] In South Africa, the percentage of physically inactive elderly people is even higher.[26] This study confirmed that people in the oldest age group often

demonstrate lower levels of physical activity than younger people.[20,21,24,46,47] Frequent and regular physical activity is a protective factor preventing CVDs and death due to CVDs; therefore, especially in this age group, measures should be taken to encourage physical activity.[30,48]

Smokers are two or three times more likely to develop HTN than nonsmokers.[49] In the present study, only 7.8% of people aged over 65 smoke cigarettes. In many countries, the reported percentage of smokers in this age group is similar.[20,21,26–28,50] However, among Brazilians, Chinese, Malaysians, and South Africans, the percentage was higher (over 15%).[24–26] In contrast, in India, nearly half of the population aged over 60 still smokes.[26]

Studies conducted among older people confirm that alcohol abuse is associated with an increase in the mean BP values.[51] Unfortunately, about 10% of those aged 65 years and older consume excessive amounts of alcohol.[24] This is confirmed by the findings of this study. In contrast, results of studies from many countries have shown a much lower percentage of alcohol abusers aged 60 and over.[26]

Depression is an independent risk factor for CVD in elderly people.[52] According to Garfield et al,[53] approximately 10% of people aged over 65 years suffer from depression. This study confirmed the occurrence of depressive symptoms in a similar proportion of elderly population. Such a high percentage (compared to younger age groups) of people with symptoms suggestive of depression in the age group >65 years requires selected measures aiming to identify such people and then provide them with proper support and psychological help.

This study showed that patients aged over 65 years compared to younger age groups are more likely to have increased levels of fasting glucose, often suffer from HTN, and are characterized by excessive body weight and abdominal obesity. To prevent the above-mentioned risk factors, it would be necessary to change the dietary habits (bad habits have been confirmed using the Menu Scoring method by Starzyńska) and increase the level of physical activity. To achieve the desired goal, it is necessary to implement extensive educational activities showing the importance of proper diet and physical activity. Patients should be aware, especially at the age of 65 and over, that at any age, it is possible to modify some bad habits. Educational activities should be introduced at various levels of the health care system as well as by interdisciplinary teams working in surgical wards, to take advantage of the hospitalization time to educate patients on how to change their lifestyle.

Conclusion

- Patients aged over 35 years, participating in the study, are a group predisposed to the development of CVD due to being diagnosed with a number of risk factors.
- Patients aged over 65 years were significantly more frequently diagnosed with the presence of risk factors such as HTN, impaired fasting glycemia, excessive body weight, and abdominal obesity.
- The elderly, in times of severe stress, seek support in faith and religion more often than younger patients.
- It would be purposeful for the members of the therapeutic team to work on comprehensive preventive measures that are specifically targeted at the elderly population who, for various reasons, are often operated on and hospitalized. These measures should take into account guidance in the field of dietetics and raising awareness of CVD risk factors.

Strengths and limitations

This is the first study conducted among patients hospitalized in surgical wards, with an aim to analyze the prevalence of CVD. The study confirmed the increasing trend in prevalence of risk factors of CVDs among the Polish population, making it necessary to develop preventive measures, especially among young people who often, only during hospitalization for surgical reasons, have a chance to stay longer in contact with a doctor or nurse, as well as among the elderly population who, for various reasons, are often operated on and hospitalized. During the stay in hospital, the professional personnel can diagnose the first symptoms of CVDs or their risk factors. However, this study also has several limitations. First, we inquired about exercising within the last 7 days; most patients are stressed prior to surgery and often do not follow their usual routine. Second, BP is probably higher than normal at the time of surgery as well, given the stress.

Disclosure

The authors report no conflicts of interest in this work.

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