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Prevalence and control of arterial hypertension in Mazovian men and women enrolled in the POLASPIRE study

Rozpowszechnienie oraz kontrola leczenia nadciśnienia tętniczego u kobiet i mężczyzn włączonych do badania POLASPIRE w województwie mazowieckim

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Abstract

Introduction. Arterial hypertension (AH) is one of the major modifiable risk factors for cardiovascular disease, which increases cardiovascular morbidity and mortality.

The aim of this study was to evaluate AH prevalence and treatment control in men and women with coronary artery disease.

Material and methods. The study included patients enrolled in the POLASPIRE trial in the Mazovian region. Definitions of risk factors and therapeutic targets were based on the 2016 European Society of Cardiology guidelines for cardiovascular prevention.

Results. AH was diagnosed in 88% of women and 81% of men ($p = 0.56$). Among AH patients, women were older than men ($p < 0.001$). There were no statistically significant gender-related differences in the prevalence of diabetes mellitus ($p = 1.00$), dyslipidemia ($p = 0.42$), and obesity ($p = 0.47$). Women were more likely to have a history of stroke ($p < 0.001$), reduced glomerular filtration rate values ($p < 0.001$), elevated low-density lipoprotein cholesterol ($p = 0.029$), and non-high-density lipoprotein cholesterol levels ($p = 0.022$) as well as echocardiographic features of left ventricular diastolic dysfunction ($p = 0.006$). 51% of women and 50% of men ($p = 1.00$) did not achieve blood pressure targets. There were no significant differences between groups regarding pharmacotherapy for AH.

Conclusions. The prevalence of AH in patients with coronary artery disease is high. A significant percentage of men and women do not achieve recommended blood pressure values. There is a need to improve the effectiveness of antihypertensive treatment.

Key words: arterial hypertension, coronary artery disease, risk factors, goal attainment

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Introduction

Arterial hypertension (AH) is one of the modifiable risk factors of cardiovascular disease (CVD), whose prevalence in the population is very high. In 2011 NATPOL study, it was found in 37% of men and 29% of women aged 18–79 years [1], and in 2013–2014 WOBASZ II survey it was confirmed in 46% of men and 40% of women aged 19–99 years [2]. Moreover, according to the World Health Organization (WHO) assessment performed in 2015, one in four men and one in five women, that is, more than one billion people worldwide, suffered from AH [3].

The persistence of elevated blood pressure (BP) leads to the development of numerous complications. AH increases morbidity and mortality due to coronary artery disease (CAD), heart failure, and stroke [4, 5], and, following diabetes mellitus (DM), is the second cause of chronic kidney disease (CKD) [6].

AH-related complications are the leading cause of premature deaths worldwide [3]. They also reduce the productivity of sick people as a consequence of their absence or inability to work, which poses a major economic burden in many countries. A number of studies have shown that a 10 mm Hg reduction in systolic BP (SBP) or a 5 mm Hg reduction in diastolic BP (DBP) is associated with a reduction in major cardiovascular (CV) incidents by about 20%, strokes by about 35%, coronary incidents by about 20%, heart failure by about 40%, and overall mortality by about 13% [7, 8].

The aim of the present study was to evaluate the incidence of organ complications, comorbidities, and the type of administered pharmacotherapy in men and women with AH who were enrolled in the POLASPIRE study [9] as representatives of the Polish Mazovian province population.

Material and methods

The study group consisted of AH patients aged ≥ 18 and < 80 years enrolled in the POLASPIRE trial in the Mazovian region, who were hospitalized for acute coronary syndrome (ACS), i.e., ST-segment elevation myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI), or unstable angina (UA), or who underwent elective percutaneous coronary angioplasty (PCI) or elective coronary artery bypass grafting (CABG) within 6 to 24 months prior to inclusion. The patients were recruited from one university hospital and one municipal hospital. An approval was obtained from a local bioethics committee, and all participants signed an informed consent form.

The study comprised two independent parts conducted between 2016 and 2017.

The first one included an analysis of patients' medical history from the time of hospitalization for the qualifying incident. Individuals who met the inclusion criteria were invited to the coordinating center in the university hospital. During the visit, they were interviewed using detailed questionnaires adopted from the EUROASPIRE V study [10], which included: medical history, CV risk factors, education, socioeconomic status, participation in cardiac rehabilitation programs, and pharmacotherapy. During the visit, BP (mean of at least two results) and heart rate were recorded, transthoracic echocardiography was performed, anthropometric measurements such as waist circumference (WC), weight, and height were taken, and blood samples were collected for laboratory tests such as blood count, lipidogram, glucose, creatinine, transaminases, creatine phosphokinase (CPK), C-reactive protein (CRP), N-terminal pro-B-type natriuretic peptide (NT-proBNP), glycated hemoglobin (HbA1c), and urine samples were taken for the determination of albumin/creatinine ratio. Glomerular filtration rate (GFR) was calculated using the Modification of Diet in Renal Disease (MDRD) formula. In patients without diagnosed DM oral glucose load tests were performed.

Height and weight were recorded in lightweight clothing without shoes using an SECA 701 scale and a model 220 growth meter. BP was measured using an Omron M6 automatic sphygmomanometer. WC was measured with a tape, midway between the lower edge of the rib arch and the upper iliac crest at the axillary midline in the standing position. Blood samples were collected after overnight fasting. Total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), and triglycerides (TG) were analyzed in serum and HbA1c in venous blood. Low-density lipoprotein cholesterol (LDL-C) was calculated according to the Friedewald formula. The non-HDL-C cholesterol concentration was calculated by subtracting the HDL-C value from the TC value.

Transthoracic echocardiography was performed according to the guidelines of the American Society of Echocardiography and the European Association for Cardiovascular Imaging [11, 12]. Left ventricular ejection fraction (EF) was assessed by Simpson's method. Echocardiographic features of left ventricular hypertrophy (LVH) were diagnosed when the left ventricular mass index (LVMI) was ≥ 115 g/m^2 in men and ≥ 95 g/m^2 in women. Left ventricular diastolic dysfunction (LVDD) was diagnosed a priori in subjects with EF < 50% and in those with EF ≥ 50% when > 2 out of 5 following parameters met the specified values: septal mitral annular e' wave velocity (e'septal) < 7 cm/s, lateral mitral annular e' wave velocity (e'lateral) < 10 cm/s, the quotient of early mitral inflow wave velocity and averaged early diastolic mitral annular velocity measured by Doppler echocardiography (E/e') > 14, tricuspid regurgitation velocity (TRV) > 2.8 m/s, left atrial volume index (LAVI) > 34 mL/m^2. The analysis excluded patients with at least moderate mitral regurgitation, any mitral valve stenosis, significant mitral annular calcification, atrial fibrillation, left bundle branch block and paced rhythm.

Study patients were considered hypertensive if AH was diagnosed before the follow-up visit based on information obtained from medical records or information card from the time of index-hospitalization. The same procedure was followed for dyslipidemia and renal disease. The diagnosis of DM was established on the basis of previous diagnosis or current glucose metabolism determined at the follow-up visit after an oral glucose load test, according to standard criteria. Smoking was assessed based on the interview conducted at the follow-up visit. The presence of overweight and obesity was defined as body mass index (BMI) ≥ 25 and < 30 kg/m^2 and ≥ 30 kg/m^2, respectively, based on measurements taken at the follow-up visit. The presence of depression and anxiety was assessed using the Hospital Anxiety and Depression Scale questionnaire, with a score lower than 8 points considered normal, 8–10 points borderline, and 11–21 points implying the diagnosis of depression or anxiety.

The definitions of risk factors and therapeutic goals were based on the 2016 European Society of Cardiology guidelines for cardiovascular prevention in clinical practice [13]. According to the guidelines, the following targets were defined: controlled diabetes: HbA1c < 7.0%; primary dyslipidemia treatment target: LDL-C < 70 mg/dL or reduction of its values by at least 50% if they were between 70 and 135 mg/dL at baseline; secondary dyslipidemia treatment target: non-HDL-C < 100 mg/dL; SBP < 140 mm Hg; DBP < 90 mm Hg, except in diabetic patients, for whom the target DPB was < 85 mm Hg; BMI: 20.0–25.0 kg/m^2; normal WC: women < 80 cm, men < 94 cm; no smoking and regular physical activity equivalent to the moderate exercise of ≥ 150 minutes per week or vigorous exercise of ≥ 75 minutes per week.

Because baseline LDL-C measurements were unavailable for a large fraction of patients making the assessment of LDL-C reduction impossible, a concentration of < 70 mg/dL was adopted as a target LDL-C level. Normal values considered for other lipids were: TC < 190 mg/dL, HDL-C < 40 mg/dL in men and < 45 mg/dL in women, TG < 150 mg/dL, and non-HDL-C < 100 mg/dL. In the case of the NT-proBNP the concentration of < 125 pg/mL was taken as normal.

Body mass reduction achieved in the post-discharged period was assessed in patients with BMI ≥ 30 kg/m^2 at the time of hospitalization. The respective treatment goal was defined as target BMI < 30 kg/m^2 in subjects with initial BMI between 30 and 35 kg/m^2 or target BMI < 35 kg/m^2 in subjects with initial BMI ≥ 35 kg/m^2.

Statistical analysis

For descriptive statistics, the significance of results was inferred based on the two-sided Student's *t*-test for variables with a normal distribution (obtaining p > 0.05 values in the Shapiro-Wilk test) or the Wilcoxon test in other cases. The chi-square test was used for categorical variables. Analyses were performed using the "stats" package of the R program, version 3.6.3.

Results

180 subjects were enrolled in the study, including 49 women (27%) and 131 men (73%). AH was diagnosed in 88% of women (W) and 81% of men (M) (p = 0.56), resulting in a group of 149 individuals, of whom 29% were women, included in the analysis. The general characteristics of hypertensive patients is shown in Tables 1 and 2.

Among patients with AH, women were older than men (age 69 vs. 64 years, respectively; p< 0.001). There was an apparent male predominance in the group under

Table 1. General characteristics of the group of men and women with coronary artery disease and arterial hypertension

Parameter	Women, N [%]	Men, N [%]	p
Number of patients	43	106	
Mean age (SD)	69 (7)	64 (8)	< 0.001
Age ≥ 65	30 (70)	48 (45)	0.011
Incident:			0.74
• elective CABG	3 (7)	8 (8)	
• elective PCI	23 (53)	47 (44)	
• STEMI	1 (2)	7 (7)	
• NSTEMI	5 (12)	11 (10)	
• UA	11 (26)	33 (31)	
History of ACS/ /CABG/PCI	26 (60)	68 (64)	0.81
Kidney disease	6 (14)	6 (6)	0.17
GFR < 60 mL/min	23 (53)	19 (19)	< 0.001
Albuminuria	12 (31)	20 (21)	0.28
Diabetes mellitus	19 (44)	47 (45)	1
Dyslipidemia	39 (91)	89 (84)	0.42
Overweight	12 (29)	50 (48)	0.048
Obesity	20 (48)	41 (39)	0.47
Central obesity	38 (88)	92 (91)	0.84
Active smoking	4 (13)	20 (23)	0.40
History of stroke	9 (21)	4 (4)	0.0023
Intervention due to lower limb arteriosclerosis	4 (9)	5 (5)	0.49
Hospitalization due to heart failure	8 (19)	14 (13)	0.56

ACS — acute coronary syndrome; CABG — coronary artery bypass surgery; GFR — glomerular filtration rate; NSTEMI — non-ST segment elevation myocardial infarction; PCI — elective coronary angioplasty; SD — standard disease; STEMI — ST-segment elevation myocardial infarction; UA — unstable coronary artery disease

Table 2. Comparison of psychosocial factors in men and women with coronary artery disease and arterial hypertension

Parameter	Women, N [%]	Men, N [%]	p
Anxiety level:			0.13
• low	27 (64)	78 (77)	
• borderline	7 (17)	15 (15)	
• high	8 (19)	8 (8)	
Depression:			0.56
• no	33 (78)	75 (74)	
• borderline	5 (12)	19 (19)	
• yes	4 (10)	7 (7)	
Education:			0.19
• high school	6 (14)	26 (25)	
• secondary school	26 (60)	48 (45)	
• below-secondary	11 (26)	32 (30)	
Employed/working	8 (19)	47 (44)	0.0057
Income:			0.51
• very low and low	16 (37)	29 (28)	
• medium	26 (60)	73 (70)	
• high	1 (2)	3 (2)	
Marital status:			< 0.001
• married	22 (51)	86 (82)	
• divorced/widow/ /widower/single	21 (49)	19 (18)	

65 years of age, and a female predominance in the group over 65 years of age.

Based on medical records from the time of hospitalization, there was no statistically significant gender-related difference in the frequency of kidney disease diagnoses (14% W vs. 6% M, p = 0.17). In laboratory tests performed during the follow-up visit, however, women were more likely than men to have a reduced GFR < 60 mL/min (53% W vs. 19% M, p < 0.001), yet with no significant difference in the frequency of albuminuria (31% W vs. 20% M, p = 0.28).

The occurrence of DM (44% W vs. 45% M, p = 1.00), dyslipidemia (91% W vs. 84% M, p = 0.42) and obesity (48% W vs. 39% M, p = 0.47) did not differ significantly between groups. Only 7% of women and 3% of men achieved weight reduction between index-hospitalization and follow-up visit (p = 0.79) (Table 3).

Considerably more women than men experienced stroke (21% W vs. 4% M, p < 0.001). There was no significant difference between groups in the rate of revascularization for lower limb atherosclerosis (9% W vs. 5% M, p = 0.49) or hospitalization for heart failure (19% W vs. 13% M, p = 0.56). Cigarettes were smoked by 13% of women and 23% of men (p = 0.40).

Table 3. Achievement of therapeutic goals in a group of women and men with arterial hypertension and coronary artery disease

Parameter	Women, N [%]	Men, N [%]	p
Blood pressure	21 (49)	52 (50)	1
Physical activity	11 (26)	31 (29)	0.80
Weight reduction	2 (7)	3 (3)	0.79
Smoking cessation	5 (56)	10 (34)	0.46
HbA1c	7 (37)	15 (32)	0.92
LDL-C	28 (35)	45 (56)	0.029
Non-HDL-C	28 (35)	43 (57)	0.022

HbA1c — glycated hemoglobin; LDL-C — low-density lipoprotein cholesterol; non-HDL-C — non-high--density lipoprotein cholesterol

Men were more often employed (19% W vs. 44% M, p = 0.0057) and more frequently declared being in a relationship (51% W vs. 82% M, p < 0.001).

At the follow-up visit, above normal LDL-C (p = 0.029) and non-HDL-C levels (p = 0.022) were more frequently recorded in women, which was reflected by significantly higher mean LDL-C (p = 0.014), TC (p < 0.001), and non--HDL-C (p = 0.01) concentrations (Table 4).

Concerning the echocardiographic findings, mean left ventricular EF was 57% in women and 54% in men (p = 0.10). Features of LVH and abnormal LAVI were found similarly frequent in both genders (LVH in 39% of women and 31% of men, p = 0.54; abnormal LAVI in 80% of women and 75% of men, p = 0.70). In contrast, features of LVDD were observed more often in women than in men (60% W vs. 55% M, p = 0.006) (Table 5).

The prevalence of elevated NT-proBNP concentrations was not markedly different between the entire groups (79% W vs. 64% M, p = 0.11), nor within subgroups having normal GFR together with coexisting: EF ≥ 50% (p = 0.45), LVH (p = 1.00) or LVDD (p = 0.78) (Table 5).

During the control visit, no significant gender-related differences were recorded with respect to mean SBP and DBP values. Mean SBP in women < 65 years of age was 141.1 mm Hg and in the group ≥ 65 years of age it was 138.0 mm Hg, while in men the respective values were 136.1 and 137.5 mm Hg (Table 6). Notably, 51% of women and 50% of men did not reach BP targets (p = 1.00) (Table 3). Among those patients mean SBP values were 156.7 and 151.0 mm Hg (p = 0.14) in women and men, respectively, and DBP were 83.3 and 89.3 mm Hg (p = 0.02), respectively.

81% of subjects confirmed being informed that they had AH, and 92% of this group (93% of women and 89% of men, p = 0.71) declared monitoring BP values. 51% claimed to know the BP targets, however, only 39% of women and 25% of men (p = 0.33) correctly indicated the upper target SBP value, and 16% of women and 12% of men (p = 0.69) correctly reported the upper target DBP value (Table 7).

Table 4. Comparison of lipidogram in men and women with with arterial hypertension and coronary artery disease

Women	Men	p	Women	Men	p
	LDL-C [mg/dL] (SD)			LDL-C ≥ 70 [mg/dL]	
85.9 (32.7)	72.3 (29.2)	0.014	28 (65)	45 (44)	0.029
	TC [mg/dL] (SD)			TC ≥ 190 [mg/dL]	
172.5 (36.5)	146.3 (36.9)	< 0.001	10 (23)	10 (10)	0.056
	HDL-C [mg/dL] (SD)			HDL-C < 40 [mg/dL] (men) < 45 mg/dl (women)	
57.6 (18.0)	48.4 (13.2)	0.0034	16 (37)	30 (29)	0.45
	TG [mg/dL] (SD)			TG ≥ 150 [mg/dL]	
145.6 (70.1)	134.0 (77.2)	0.088	13 (30)	29 (28)	0.96
	non-HDL-C [mg/dL] (SD)			non-HDL-C ≥ 100 [mg/dL]	
114.9 (37.4)	97.9 (35.6)	0.010	28 (65)	43 (43)	0.022

HDL-C — high-density lipoprotein cholesterol; LDL-C — low-density lipoprotein cholesterol; SD — standard disease; TC — total cholesterol

Table 5. Comparison of echocardiographic parameters and N-terminal pro-B-type natriuretic peptide (NT-proBNP) concentrations in men and women with arterial hypertension and coronary artery disease at the follow-up visit

Parameter	Women, N [%]	Men, N [%]	p
EF [%] (SD)	57 (9)	54 (10)	0.10
LVH	13 (39)	26 (31)	0.54
LAVI	32 (80)	76 (75)	0.70
LVDD	26 (60)	58 (55)	0.006
NT-proBNP ≥ 125 pg/mL	34 (79)	68 (64)	0.11
NT-proBNP ≥ 125 pg/mL, GFR > 60 mL/min and:			
• EF ≥ 50%	10 (59)	25 (45)	0.45
• LVH	5 (83)	15 (79)	1.00
• LVDD	4 (50)	8 (67)	0.78

EF — ejection fraction; GFR — glomerular filtration rate; LAVI — left atrial volume index; LVDD — left ventricular diastolic dysfunction; LVH — left ventricular hypertrophy; SD — standard disease

Women and men were equally likely to be administered all hypotensive drug groups (Table 8), with 95% of women and 92% of men receiving medications from the beta-blocker group, 90% of women and 84% of men receiving angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor antagonists, 37% of women and 27% of men taking calcium channel antagonists, and 60% of women and 52% of men diuretics, including 14% of women and 6% of men who were taking mineralocorticoid receptor antagonists (p = 0. 096).

Discussion

In the analyzed group, AH was diagnosed in 88% of women (mean age 69 years) and 81% of men (mean age 64 years). Accordingly, the prevalence of AH was higher than recorded in a 2005 study involving patients with CAD, in which AH was diagnosed in 70% of participants [14]. Likewise, in the NATPOL study AH was diagnosed in 32% of the Polish population, and specifically in 57% of subjects aged ≥ 60–79 years. Moreover, in the PolSenior study [15], conducted on a group of people aged ≥ 65 years, it was diagnosed in 76% of cases. Thus, AH in the discussed group appeared to be more frequent than in the above-mentioned studies, which could be due to several reasons. First, the mean age of the study participants was over 60 years, while it is known that the prevalence of AH increases with age. Another reason could be that AH is one of the major risk factors for CAD, and consequently, its prevalence in CAD patients is higher than in the general population. Yet

Table 6. Comparison of blood pressure values in women and men with diagnosed arterial hypertension and coronary artery disease at the time of hospitalization and follow-up visit

Parameter	Mean BP value in mm Hg (SD)		Number		p
	Women	Men	Women	Men	
Hospitalization					
SBP, the whole group	131.5 (26.6)	133.0 (25.3)	43	106	0.75
DBP, the whole group	76.7 (15.4)	79.3 (17.2)	43	106	0.36
SBP, age ≥ 65 years	135.9 (17.9)	135.2 (15.6)	30	50	0.87
DBP, age ≥ 65 years	77.1 (10.1)	80.1 (10.2)	30	50	0.19
SBP, age < 65 years	121.4 (39.3)	131.0 (31.6)	13	56	0.42
DBP, age < 65 years	75.8 (24.2)	78.6 (21.8)	13	56	0.69
Follow-up					
SBP, the whole group	138.9 (22.6)	136.7 (20.9)	43	105	0.45
DBP, the whole group	78.8 (11.6)	82.4 (11.3)	43	105	0.065
SBP, age ≥ 65 years	138.0 (23.8)	137.5 (18.9)	30	47	0.62
DBP, age ≥ 65 years	76.7 (12.2)	79.5 (10.1)	30	47	0.24
SBP, age < 65 years	141.1 (20.2)	136.1 (22.5)	13	58	0.52
DBP, age < 65 years	83.8 (8.4)	84.7 (11.7)	13	58	0.49
SBP, no BP goal achievement	156.7 (12.3)	151.0 (16.8)	22	53	0.14
DBP, no BP goal achievement	83.3 (11.7)	89.3 (8.9)	22	53	0.021
SBP, BP goal achievement	120.3 (14.0)	122.1 (13.0)	21	52	0.66
DBP, BP goal achievement	74.1 (9.6)	75.3 (8.7)	21	52	0.63

BP — blood pressure; DBP — diastolic blood pressure; SBP — systolic blood pressure; SD — standard disease

Table 7. The extent of knowledge about hypertension

Variable	Women, N [%]	Men, N [%]	p
Informed about AH	35 (81)	86 (81)	0.30
Monitors BP	40 (93)	93 (89)	0.71
Declares knowing target BP	23 (53)	52 (49)	0.24
Knows target SBP	9 (39)	13 (25)	0.33
Knows target DBP	7 (16)	13 (12)	0.69

AH — arterial hypertension; BP — blood pressure; DBP — diastolic blood pressure; SBP — systolic blood pressure

Table 8. Hypotensive drugs used in women and men at the follow-up visit

Drug group	Women, N [%]	Men, N [%]	p
Beta-blockers	41 (95)	97 (92)	0.64
ACE-inhibitors	29 (67)	76 (72)	0.75
Sartans	10 (23)	13 (12)	0.15
Diuretics	26 (60)	55 (52)	0.44
Calcium antagonists	16 (37)	29 (27)	0.32
Other hypotensive drugs	1 (2)	6 (6)	0.66

ACE — angiotensin-converting enzyme

another reason may be a tendency to falsely assign AH diagnosis in the situation of prescribing hypotensive drugs for other reasons, including CAD.

In our study, as many as half of the hypertensive patients had above normal BP values during the follow-up visit. This percentage was slightly higher than in the EUROASPIRE V study [10] in which 46% of participants receiving hypotensive drugs had BP higher than recommended at the follow-up visit. On the other hand, it was lower than that found in the NATPOL or WOBASZ II studies, in which as many as 73% of individuals did not achieve target BP values. The percentage of subjects with abnormal BP values was also lower than in the previously mentioned 2005 study conducted in CAD patients, in which 69% of participants had abnormal BP values. This may indicate an improvement in the efficacy of hypotensive treatment in CAD patients, which is in line with observations concerning the general population [2].

Meta-analyses have unequivocally shown that lowering systolic as well as diastolic BP per se is associated with a significant reduction in the incidence rate of all serious CV events and overall mortality [7, 8]. Recent studies have confirmed that these observations also apply to patients with stage 1 hypertension [16, 17], the elderly [18], and, in the case of CAD patients, to individuals with high normal BP in whom lowering BP was associated with a reduction in major CV incidents but had no effect on mortality [19]. Moreover, in the meta-analysis by D. Ettehad et al [7], as well as the meta-analysis of the ONTARGET and TRANSCED trials [20] it was found that the greatest benefit in most patients is achieved by lowering SBP to 120–130 mm Hg and DBP to 70–80 mm Hg.

In the light of these reports, the recent 2018 European Society of Cardiology/European Society of Hypertension (ESC/ESH) guidelines for the management of hypertension [21] indicated that hypotensive treatment can be considered in very high CV risk patients, particularly those with CAD, already in the presence of high normal BP [19]. These guidelines also recommend lowering BP targets in most patients taking hypotensive drugs: SBP to 120–129 mm Hg in age group < 65 years, and to 130–139 mm Hg in age group ≥ 65 years old, while DBP to a value of 70–79 mm Hg, regardless of the level of risk and associated diseases.

Regrettably, in the analyzed group, which should remain under more intensive control of CVD risk factors due to the history of ACS or coronary intervention, as many as half of the patients had SBP values > 150 mm Hg at the follow-up visit. Moreover, in the group of women < 65 years of age, the mean SBP value exceeded the upper limit of 140 mm Hg norm.

A high proportion of study patients had subclinical organ complications and comorbidities, with more frequent history of stroke and reduced GFR in women. GFR is the best available marker of kidney function, and the persistence of its lowered values for more than 3 months allows the diagnosis of CKD. AH is the second, after DM, cause of CKD development and progression, which additionally increases the risk of premature death, largely due to CVD [6]. LVDD was more frequently registered in women, and its presence is also associated with higher total mortality and more frequent hospitalizations for heart failure [22]. It is also worth emphasizing that the majority of patients, despite the declaration of BP monitoring, did not know the appropriate target BP values.

There was no gender-related difference in the type of pharmacotherapy administered to lower BP values, the choice of which was undoubtedly influenced by the presence of CAD. Both genders were equally likely to take drugs from all groups of hypotensive medications. This is of importance in the light of numerous studies conducted with ACE inhibitors (e.g. HOPE [23], PROGRESS [24], SMILE [25]), angiotensin II receptor antagonists (e.g. LIFE [26], VALUE [27], ONTARGET/TRANSCED [28, 29]) or calcium antagonists (e.g., ASCOT [30], VALUE), which demonstrated, that just lowering BP values, and not the type of drug used to do so, is the main determinant of risk reduction for CV complications.

The study has several limitations. First, it involves a strictly selected group of patients. Second, BP control was assessed based on measurements taken at the time of the follow-up visit rather than 24-hour ambulatory or home BP monitoring. On the one hand, this might have led to BP overestimation as a consequence of the white coat reaction, but on the other hand, it might have also contributed to its underestimation in cases of masked hypertension. Due to the lack of creatinine level measurements 3 months before the follow-up visit, it was impossible to diagnose chronic kidney failure.

Conclusions

The prevalence of AH in high-risk CV patients is high. In addition, a large proportion of patients with CAD do not achieve BP targets recommended by the guidelines. No significant gender-related differences were found in this regard. Targeted educational programs are needed to increase the awareness of CVD risk factors and improve the effectiveness of hypertension treatment.

Conflict of interest

None declared.

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Streszczenie

Wstęp. Nadciśnienie tętnicze (AH) jest jednym z głównych, modyfikowalnych czynników ryzyka chorób układu sercowo-naczyniowego, który zwiększa zachorowalność i umieralność z powodu tych schorzeń.

Celem pracy była ocena rozpowszechnienia oraz kontrola leczenia AH u kobiet i mężczyzn z chorobą wieńcową.

Materiał i metody. Badanie przeprowadzono w grupie chorych włączonych do badania POLASPIRE w województwie mazowieckim. Definicje czynników ryzyka i celów terapeutycznych oparto na wytycznych Europejskiego Towarzystwa Kardiologicznego z 2016 roku dotyczących prewencji sercowo-naczyniowej.

Wyniki. AH rozpoznano u 88% kobiet i 81% mężczyzn (p = 0,56) włączonych do analizy. W grupie chorych z AH kobiety były starsze niż mężczyźni (p < 0,001). Częstości rozpoznawania cukrzycy (p = 1,00), dyslipidemii (p = 0,42) oraz otyłości (p = 0,47) nie różniły się istotnie pomiędzy grupami. U kobiet częściej stwierdzano przebyty udar mózgu (p < 0,001), obniżony współczynnik filtarcji kłębuszkowej (p < 0,001), podwyższone wartości cholesterolu frakcji lipoprotein o niskiej gęstości (p = 0,029), cholesterolu niezwiązanego z lipoproteinami o wysokiej gęstości (p = 0,022) oraz cechy dysfunkcji rozkurczowej lewej komory (p = 0,006). Docelowych wartości ciśnienia tętniczego nie osiągnęło 51% kobiet i 50% mężczyzn (p = 1,00). Nie stwierdzono istotnych różnic między grupami w zakresie farmakoterapii AH.

Wnioski. Rozpowszechnienie AH u osób z chorobą wieńcową jest duże. Wysoki odsetek chorych nie osiąga zalecanych wartości ciśnienia tętniczego. Konieczne jest podjęcie działań służących poprawie skuteczności leczenia hipotensyjnego.

Słowa kluczowe: nadciśnienie tętnicze, choroba wieńcowa, czynniki ryzyka, osiągnięcie celów terapeutycznych

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