ORIGINAL ARTICLE

Cardiovascular therapy, diagnostic procedures, and control of risk factors in patients with diabetes or coronary artery disease in Poland: the Kardia-Pol registry

Grzegorz Opolski[1], Krzysztof Strojek[2], Michał Kurzelewski[3], Maciej Ostrowski[3], Daniel Rabczenko[4]

1 1st Department of Cardiology, Warsaw Medical University, Independent Public Central Clinical Hospital, Warszawa, Poland
2 Silesian Center for Heart Diseases, Zabrze, Poland
3 Sanofi-Aventis, Warszawa, Poland
4 National Institute of Public Health – National Institute of Hygiene, Warszawa, Poland

KEY WORDS

diagnostic procedures, registry, risk factors

ABSTRACT

INTRODUCTION Diabetes mellitus (DM) and coronary artery disease (CAD) are associated with increased cardiovascular risk.

OBJECTIVES The aim of the study was to compare management of high-risk patients with DM and patients with CAD in Poland.

PATIENTS AND METHODS Randomly selected primary care offices enrolled patients aged 55 years and older, with DM and no documented CAD (n = 210) or with CAD and no documented DM (n = 186).

RESULTS Statins were given to 64% vs. 87% (P <0.05), acetylsalicylic acid (ASA) to 53% vs. 84% (P <0.05), and angiotensin-converting enzyme inhibitors to 70% vs. 69% (P = 0.8) of the patients with DM and CAD, respectively. Screening tests to detect glucose abnormalities in patients with CAD or to detect CAD in patients with DM were not performed in 26% of patients with DM and 24% of those with CAD (P = 0.64). Mean systolic blood pressure was 136.8 ±13.6 vs. 131.7 ±15.8 mmHg (P = 0.001), diastolic blood pressure was 80.4 ±7.4 vs. 79.4 ±11.6 mmHg (P = 0.316), and total cholesterol was 196 ±42 vs. 183 ±42 mg/dl (P = 0.003) in patients with DM and CAD, respectively. The percentage of patients with blood pressure below 140/90 mmHg, total cholesterol below 175 mg/dl, and low-density lipoprotein (LDL) cholesterol below 100 mg/dl was 15% vs. 25% (P = 0.055), while the percentage of patients with blood pressure below 130/80 mmHg, total cholesterol below 175 mg/dl, and LDL cholesterol <70 mg/dl was 1% vs. 3% (P = 0.016) in the DM vs. CAD groups, respectively.

CONCLUSIONS Use of statins and ASA was more frequent in patients with CAD than in patients with DM. Control of risk factors in the study population was better in the CAD group but still unsatisfactory in most patients.

Correspondence to:
Prof. Grzegorz Opolski, MD, PhD,
I Katedra i Klinika Kardiologii,
Warszawski Uniwersytet Medyczny,
Samodzielny Publiczny Centralny
Szpital Kliniczny, ul. Banacha 1a,
02-097 Warszawa, Poland,
phone: +48-22-599-19-58,
fax: +48-22-599-19-57, e-mail:
grzegorz.opolski@wum.edu.pl
Received: May 16, 2012.
Revision accepted: July 9, 2012.
Published online: July 19, 2012.
Conflict of interest: All authors participated in the registry that was financed by a research grant from Sanofi-Aventis. M.K. is an employee of Sanofi-Aventis Poland and M.O. was an employee of Sanofi-Aventis Poland at the time of the study.
Pol Arch Med Wewn. 2012; 122 (9): 413-421

INTRODUCTION Both diabetes mellitus (DM) and coronary artery disease (CAD) are associated with an increased risk of cardiovascular complications, including myocardial infarction (MI) and death. Therapy with angiotensin-converting enzyme inhibitors (ACEIs), statins, and acetylsalicylic acid (ASA) has been shown to reduce the risk of cardiovascular events in various clinical settings. Thus, these drugs should be used both in high-risk patients with DM and in patients with CAD.[1,2] However, some studies indicate that cardiovascular drugs are underused in patients with DM despite their proven efficacy.[3,4]

DM and CAD often coexist, leading to further elevation of cardiovascular risk. Consequently, regular screening is recommended to detect

coronary disease in patients with DM, as well as screening for glucose metabolism abnormalities in patients with CAD.[5]

Mortality from cardiovascular diseases in Poland is higher than in Western Europe,[6] and both CAD and DM are frequent in patients examined by primary care physicians in Poland.[7] Therefore, therapeutic habits of primary care physicians should have a substantial impact on the prognosis of patients with CAD and DM in Poland.

For these reasons, it is interesting to measure the adherence level of primary care physicians to the current guidelines in terms of the management of high-risk patients with DM and patients with CAD. The aims of the study were to compare the use of statins, ACEIs, and ASA as well as to compare the performance of relevant screening procedures in patients with DM and no CAD and patients with CAD and no DM. An additional aim was to assess and compare the control of modifiable risk factors in the studied groups and to compare patients' demographics.

PATIENTS AND METHODS

The Kardia-Pol registry was an observational survey conducted in 20 centers in Poland. The study centers were primary care offices randomly selected from a list of all primary care offices in Poland (available at http://www.rejestrzoz.gov.pl/RZOZ/; access date, November 9, 2009). In the process of random selection, in order to preserve the proportions of primary care offices in Poland (based on their ownership status: public vs. nonpublic, and based on their location: cities vs. other locations), the primary care offices in Poland were divided into the above 4 categories and then listed in a random order. Next, a proportionate number of offices listed first in each category was invited to participate in the study.

The study protocol was approved by the Ethics Committee at the Medical Academy in Warsaw. All study participants were informed about the aims and methods of the study. Written informed consent was obtained from each patient.

Patients eligible for the study were men and women aged 55 or older, with either DM without known CAD or with CAD without known DM. Patients were considered as having DM if the diagnosis was made based on standard criteria[8]: 1) casual plasma glucose ≥200 mg/dl, 2) fasting plasma glucose ≥126 mg/dl, 3) abnormal result of the oral glucose tolerance test, or 4) current therapy with insulin, oral glucose-lowering agents, or both. Patients were considered as having CAD if they had typical symptoms and one of the following: 1) ≥50% stenosis in epicardial coronary artery in coronary angiography, 2) electrocardiographic signs of previous MI, or 3) segmental contractility defects in echocardiography, signs of ischemia on scintigraphy, or presence of postinfarction scar in nuclear magnetic resonance imaging. Patients with coexisting CAD and DM as well as type 1 diabetics were excluded. The study also excluded patients who had participated in a clinical trial in the field of DM or CAD in the previous 3 months, as well as patients unable to understand or sign written informed consent.

Each participating center was asked to recruit at least 10 consecutive patients presenting with DM and at least 10 consecutive patients presenting with CAD regardless of the purpose of the visit to minimize patient selection bias. The maximal total number of patients enrolled by a single study center was 30.

The study had 2 primary outcome measurements: 1) usage of 3 drug classes (statins, ACEIs, and ASA) in both studied groups, and 2) performance of recommended diagnostic tests to detect CAD in patients with DM or to detect abnormalities in glucose metabolism in patients with CAD. The secondary outcome measurements were the level of control of modifiable cardiovascular risk factors and demographic characteristics of the studied populations.

Sample size calculation and statistical analysis

Sample size was planned based on the assumption that frequency of recommended diagnostic procedures in one study group is 85%. Sample size necessary to obtain 5% precision of estimates and to show significant 10% difference between the groups was found to be 200 in each arm of the study (400 overall).

Comparison between patients with DM and patients with CAD was made using the χ^2 test (or the exact Fisher's test when comparing low-frequency variables) for categorical variables, and *t* test or Mann-Whitney *U* test (for non-normal data). Normality of the data was checked using the Shapiro-Wilk test. The analysis was done using R 2.13 program (R Development Core Team [2011]. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3–900 051-07-0, http://www.R-project.org).

RESULTS

Between January and June 2010, 396 patients were enrolled in the study in 20 study centers: 210 patients with DM and 186 patients with CAD. Demographic parameters are shown in TABLE 1. As compared with patients with CAD, patients with DM had higher mean body mass, body mass index, and waist circumference; they also had higher systolic blood pressure and heart rate (P <0.05 for all respective comparisons between the groups).

TABLE 2 presents details of concomitant diseases and risk factors. Because patients with both concomitant DM and CAD were not included in the study, there were no patients with a history of MI in the DM group. Fewer patients with DM had concomitant heart failure or atrial fibrillation, while slightly more (though not statistically significant) had concomitant hypertension as compared with patients with CAD (85% vs. 77%, P = 0.061). There were no differences in the incidence of other cardiovascular diseases or

TABLE 1 Demographic characteristics and results of physical examination

Parameter		Patients with DM	Patients with CAD	*P* for comparison
women, n (%)		126 (60)	59 (32)	<0.001
age, y		65.7 ±7.6	68.7 ±7.4	<0.001
body mass, kg	women	79.2 ±12.8	71.3 ±13.6	<0.001
	men	89.9 ±13.1	82.1 ±13.3	<0.001
body mass index, kg/m^2		30.9 ±4.7	27.9 ±4.5	<0.001
waist circumference, cm	women	100.9 ±12.8	92.9 ±13.2	<0.001
	men	105.2 ±11.2	99.1 ±11.1	<0.001
systolic blood pressure, mmHg		136.8 ±13.6	131.7 ±15.8	0.001
diastolic blood pressure, mmHg		80.4 ±7.4	79.4 ±11.6	0.316
heart rate, beats/min		73.6 ±7.7	71.3 ±9.9	0.012

Data are presented as mean ± SD or numbers (%).

Abbreviations: CAD – coronary artery disease, DM – diabetes mellitus, SD – standard deviation

TABLE 2 Concomitant diseases and risk factors

Parameter	Patients with DM	Patients with CAD	*P* for comparison
history of MI	0 (0)	119 (64)	<0.001
history of stroke	9 (4)	14 (8)	0.246
diagnosed peripheral artery disease	14 (7)	23 (12)	0.076
hypertension	179 (85)	144 (77)	0.061
dyslipidemia	154 (73)	131 (70)	0.596
heart failure	13 (6)	60 (32)	<0.001
atrial fibrillation	8 (4)	19 (10)	0.02
everyday physical activity as declared by the patient	147 (70)	129 (69)	0.976
everyday consumption of fruits and vegetables as declared by the patient	168 (80)	142 (76)	0.448
smoking status			
current smokers	14 (7)	19 (10)	0.274
smoking cessation within the last 15 months	13 (7)	15 (9)	0.004
smoking cessation earlier than within the last 15 months	60 (31)	76 (46)	
never smoked	123 (63)	76 (46)	

Data are presented as numbers (%).

Abbreviations: MI – myocardial infarction, others – see TABLE 1

risk factors between the studied groups. However, despite the fact that the percentage of current smokers was relatively low and similar in both groups, more diabetic patients declared that they had never smoked, while patients with CAD were more likely to have stopped smoking prior to inclusion.

Relevant diagnostic tests to screen CAD in patients with DM or glucose metabolism abnormalities in patients with CAD were performed in approximately three-quarters of the studied patients without any significant difference between the groups. In patients with DM, the most common diagnostic test was resting electrocardiogram (ECG; 99%), followed by echocardiography (14%) and exercise ECG (5%). Of 142 patients with CAD who underwent a screening test, 141 (99%) had a blood fasting glucose test and 18 (13%) had an oral glucose tolerance test performed within 15 months prior to the study visit (TABLE 3).

Patients with DM were less likely to receive statins and ASA than patients with CAD. In line with the guidelines, the use of statins and ASA in diabetic patients should be considered in those who have either concomitant cardiovascular disease, hypertension, or cardiovascular risk factors (cigarette smoking, blood pressure >140/90 mmHg, total cholesterol >135 mg/dl, low-density lipoprotein (LDL) cholesterol >100 mg/dl, high-density lipoprotein (HDL) cholesterol <39 mg/dl in men and <46 mg/dl in women).[5] At least one of the above criteria was met in 376 of 386 patients (97.4%) available for evaluation with DM.

TABLE 3 Pharmacological therapy and diagnostic tests

	Patients with DM	Patients with CAD	*P* for comparison
drugs			
acetylsalicylic acid	111 (53)	156 (84)	<0.001
ACEIs	147 (70)	128 (69)	0.799
ramipril, n (%)	59 (40)	61 (48)	
mean dose, mg/d	8.7 ±2.9	6.3 ±3.6	0.001
perindopril, n (%)	20 (14)	24 (19)	
mean dose, mg/d	6.8 ±2.6	5.9 ±2.2	0.220
enalapril, n (%)	22 (15)	7 (6)	
mean dose, mg/d	39.3 ±24.7	22.9 ±12.5	0.03
statins	135 (64)	161 (87)	<0.001
atorvastatin, n (%)	55 (41)	70 (44)	
mean dose, mg/d	21.3 ±7.9	29.9 ±12.2	<0.001
simvastatin, n (%)	78 (58)	91 (57)	
mean dose, mg/d	20.1 ±5.6	23.7 ±8.6	0.003
diagnostic tests[a]			
diagnostic test performed	156 (74)	142 (76)	0.64
resting ECG within the last 15 months	155 (99)	NA	
exercise ECG within the last 15 months	8 (5)	NA	
echocardiography within the last 24 months	22 (14)	NA	
stress echocardiography within the last 24 months	1 (0.5)	NA	
perfusion scintigraphy within the last 24 months	0 (0)	NA	
computed tomography cardiac imaging within the last 24 months	0 (0)	NA	
blood fasting glucose test within the last 15 months	NA	141 (99)	
oral glucose tolerance test within the last 15 months	NA	18 (13)	

Data are presented as numbers (%) or means ± SD as appropriate.

a diagnostic tests to detect CAD in patients with DM and tests to detect DM in patients with CAD

Abbreviations: ACEI – angiotensin-converting enzyme inhibitor, ECG – electrocardiography, NA – not applicable, others – see TABLE 1

ACEIs were used with similar frequency in both groups. Mean daily dose of ramipril and enalapril was significantly higher in patients with DM compared with patients with CAD, and the difference in the daily dose of another commonly prescribed ACEI, perindopril, did not reach statistical significance. Conversely, mean daily dose of the 2 most commonly prescribed statins (simvastatin and atorvastatin) was lower in patients with DM compared with patients with CAD (TABLE 3).

Data on total cholesterol concentration was available for 198 patients (94%) with DM and 178 patients (96%) with CAD. Patients with DM had higher mean total cholesterol concentration than patients with CAD. Data on LDL cholesterol concentration was available for 151 patients (72%) with DM and 146 patients (78%) with CAD, and data on HDL cholesterol was available for 163 (78%) and 152 (82%) patients, respectively. There were no differences in mean LDL and HDL cholesterol concentrations between the studied groups except for higher mean LDL concentration in diabetic men compared with those with CAD. Data on concentration of glycated hemoglobin (HbA_{1c}) was available for 93 diabetic patients (44%); mean HbA_{1c} concentration was 7.6% ±1.8% (TABLE 4).

We also assessed the level of control of blood pressure and plasma lipids in the studied cohort. Patients with DM less often reached target blood pressure and total cholesterol concentration than patients with CAD, while the difference in target LDL cholesterol was not significant (TABLE 5). The percentage of patients who reached target values of modifiable risk factors was 15% in patients with DM vs. 25% in patients with CAD (P = 0.055) for the less strict criteria (blood pressure <140/90 mmHg, LDL cholesterol <100 mg/dl) and 1% in patients with DM vs. 3% in those with CAD (P = 0.016) for the more strict

TABLE 4 Laboratory test results

Parameter	Patients with DM	Patients with CAD	*P* for comparison
total cholesterol, mg/dl			
all patients	196 ±42	183 ±42	0.003
women	196 ±46	187 ±43	0.194
men	196 ±37	181 ±41	0.009
LDL cholesterol, mg/dl			
all patients	112 ±40	106 ±37	0.209
women	107 ±42	111 ±45	0.618
men	119 ±36	104 ±34	0.009
HDL cholesterol, mg/dl			
all patients	52 ±17	50 ±14	0.119
women	55 ±18	53 ±15	0.526
men	49 ±15	48 ±13	0.832
HbA_{1c}, %	7.6 ±1.8	–	–

Data are presented as mean ± SD; for conversion of total, LDL, and HDL cholesterol concentrations to mmol/l, multiply by 0.0259.

Abbreviations: LDL – low-density lipoprotein; HDL – high-density lipoprotein, others – see TABLE 1

criteria (blood pressure <130/80 mmHg, LDL cholesterol <70 mg/dl) (TABLE 6).

DISCUSSION The Kardia-Pol registry allowed for a direct comparison of the management of a representative sample of high-risk patients with DM and patients with CAD seen by the same primary care physicians in Poland. Patients with DM included in the registry represent high-risk DM patients as they were all aged 55 or older and almost all had either concomitant atherosclerotic disease or at least 1 additional cardiovascular risk factor. The use of statins and ASA was found to be less frequent in patients with DM compared with patients with CAD, while the use of ACEIs was similar in both groups. Despite clear recommendations presented in the guidelines issued by the Polish Diabetes Association, as well as the European Society of Cardiology,[1,2] simple tests to detect CAD (which should be performed every 12 months in patients with DM) or tests to detect abnormalities in glucose metabolism (which should be performed every 12 months in patients with CAD) were not performed in almost 25% of the patients. The level of control of modifiable risk factors (blood pressure and plasma lipids) in the studied patients was not satisfactory.

Although the prevalence of dyslipidemia was similar in both groups, patients with CAD received statins more frequently and in higher doses than patients with DM. The difference in mean statin doses between patients with CAD and patients with DM was also observed in a recent German 2L registry conducted on patients with CAD and patients with a CAD-equivalent (90% of patients with "CAD-equivalent" had DM).[9] In our registry, the target total cholesterol concentration (<175 mg/dl) was reached less often in patients with DM than in those with CAD. For LDL concentration, there were no differences between the groups in the percentage of patients who reached the target level (<100 mg/dl). When

TABLE 5 Number of patients reaching therapeutic targets goals

Therapeutic target goals	Patients with DM	Patients with CAD	All patients	*P* for comparison
blood pressure				
systolic blood pressure ≤130 mmHg	90 (43)	111 (60)	201 (51)	0.001
diastolic blood pressure ≤80 mmHg	145 (69)	140 (75)	285 (72)	0.206
blood pressure ≤130/80 mmHg (achieved both values)	79 (38)	99 (53)	178 (45)	0.003
systolic blood pressure ≤140 mmHg	155 (83)	154 (73)	309 (78)	0.023
diastolic blood pressure ≤90 mmHg	206 (98)	176 (95)	382 (97)	0.111
blood pressure ≤140/90 mmHg (achieved both values)	151 (81)	154 (73)	305 (77)	0.083
lipids				
total cholesterol <175 mg/dl	71 (36)	85 (48)	156 (42)	0.026
LDL cholesterol <100 mg/dl	62 (41)	72 (49)	134 (45)	0.189
LDL cholesterol <70 mg/dl	22 (15)	25 (17)	47 (16)	0.657

Data are presented as numbers (%); for conversion of total, LDL, and HDL cholesterol concentrations to mmol/l, multiply by 0.0259.

Abbreviations: see TABLES 1 and 4

TABLE 6 Number of patients who reached a given number of treatment targets in the study groups

Treatment targets	Patients with DM	Patients with CAD	*P* for comparison
number of therapeutic targets achieved (less strict criteria: total cholesterol <175 mg/dl; LDL cholesterol <100 mg/dl; systolic blood pressure <140 mmHg; diastolic blood pressure <90 mmHg)			
none	10 (7)	9 (6)	
1	29 (19)	16 (11)	
2	58 (39)	47 (32)	0.055
3	30 (20)	38 (26)	
4	22 (15)	36 (25)	
number of therapeutic targets achieved (more strict criteria: total cholesterol <175 mg/dl; LDL cholesterol <70 mg/dl; systolic blood pressure <130 mmHg; diastolic blood pressure <80 mmHg)			
none	44 (30)	31 (21)	
1	65 (44)	52 (36)	
2	30 (20)	36 (25)	0.016
3	8 (5)	22 (15)	
4	2 (1)	5 (3)	

Data are presented as numbers (%); for conversion of total, LDL, and HDL cholesterol concentrations to mmol/l, multiply by 0.0259.

Abbreviations: see TABLES 1 and 4

we applied the more strict criteria of lipid control recommended by the recent European guidelines on the treatment of dyslipidemia (i.e., LDL <70 mg/dl for both patients with DM and patients with CAD),[10] we found that these values were achieved in 16% of all patients. These data indicate improved control of plasma lipids in Poland compared with previous registries.

Patients with DM treated by non-diabetologists in Poland were reported to have mean LDL cholesterol concentration of 131 mg/dl,[11] and patients with CAD had mean LDL concentration of 125 mg/dl.[12] In ambulatory high-risk patients seen by primary care physicians in Poland (of whom 50% had CAD and 30% had DM), only 15.6% of patients had LDL below 100 mg/dl.[13] Michalak et al.[14] reported that only 10% of the patients with DM and CAD had their LDL below 100 mg/dl. The difference observed between the Kardia-Pol and earlier registries might reflect a true improvement in patient management. However, it is also possible that it reflects some methodological differences between the Kardia-Pol and the earlier studies, the most important difference being that in the earlier studies patients were enrolled if their visit to a physician was associated with a modification of the lipid-lowering therapy. This may have led to underestimation of the true therapeutic success in the treatment of dyslipidemia in these studies.[13,14] The percentage of diabetic patients taking statins in the Kardia-Pol registry was similar to the percentage reported in a recent large retrospective study in Americans with DM (63%).[4]

We found a trend towards greater prevalence of hypertension in patients with DM compared with patients with CAD, but the use of ACEIs did not differ between the studied groups. However, in patients with DM, the daily doses of ACEIs most often used in the studied patients were higher than the daily doses used in patients with CAD.

Patients with DM received ASA significantly less often than patients with CAD. ASA failed to decrease the risk of cardiovascular events in patients without established cardiovascular disease[15] and did not mitigate the risk of cardiovascular events or death in patients with DM and asymptomatic peripheral artery atherosclerosis.[16] Despite this, the guidelines of the Polish Diabetes Association which were applicable in 2009, i.e., at the time when the Kardia-Pol registry was conducted,[1] recommended ASA in all patients with DM older than 40 years at increased risk of cardiovascular events. This recommendation was sustained in the guidelines update issued in 2011, which clarified that the increased risk means >5% of risk of cardiovascular events.[17] In patients with CAD, ASA should be used in all patients without contraindications.[2] The use of ASA in patients with CAD enrolled in the Kardia-Pol registry (nearly 85%) was higher as compared with about 75% in patients enrolled in the earlier RECENT registry.[12]

Good control of cardiovascular risk factors is essential in the treatment of both CAD and DM and has been shown to have a positive effect on a 3-year cardiovascular event rate in patients with stable atherosclerotic disease.[18] Plasma total and LDL cholesterol as well as systolic and diastolic blood pressure are especially important. There are some differences regarding the actual target values of these risk factors depending on the guidelines. Serum total and LDL cholesterol concentrations should be less than 175 and 100 mg/dl, respectively, both in patients with DM and patients with CAD.[1,2] However, the guidelines on the management of dyslipidemia issued in 2011 recommend LDL levels below 70 mg/dl in such patients.[10] Similarly, targets for blood pressure

also differ both for patients with DM and for patients with CAD according to the European and Polish guidelines on the treatment of hypertension, CAD, and DM (generally between <130/80 and <140/90 mmHg).[1,2,19,20] For these reasons, we have assessed the control of plasma lipids and blood pressure by counting the number of patients with 3 or 4 values at target using the arbitrarily chosen 2 categories of "more strict" control (LDL, <70 mg/dl; blood pressure, <130/80 mmHg) and "less strict" control (LDL, <100 mg/dl; blood pressure, <140/90 mmHg). We found that good control was more frequent in patients with CAD than in patients with DM, both when more and less strict criteria were used.

DM and CAD often coexist. In the Polish population, approximately 25% of the patients with DM have concomitant CAD.[11] Similarly, a quarter of the patients with CAD have concomitant DM.[12] Given the fact that the coexistence of these 2 diseases markedly increases the cardiovascular risk and that patients with DM often have atypical symptoms of CAD, these patients should periodically undergo routine tests to detect CAD. Similarly, patients with CAD should periodically undergo tests to detect possible abnormalities in glucose metabolism.[1,2] In our study, these tests were not performed in almost a quarter of the studied sample – a surprising finding given the fact that the tests recommended in the guidelines are simple, noninvasive, easy achievable, and relatively inexpensive.[1,2]

Limitations of the study There are several important limitations of the Kardia-Pol registry. First, the design of the study allowed only for the collection of data available in medical documentation. Since data on HbA_{1c}, an important parameter for the control of DM, were available for less than a half of the studied patients, it may not reflect the actual level of this parameter in the general population of patients with DM in Poland. Second, this registry was conducted only among primary care physicians. Treatment of patients by primary care physicians may be different from treatment by specialists. In fact, some differences were found in the treatment of patients between diabetologists and non-diabetologists in Poland.[11] Third, the registry excluded patients with coexisting DM and CAD. As discussed above, there is a 25% overlap in these 2 populations. Consequently, the registry is representative for about 75% of the population of patients with DM and 75% of the population of patients with CAD in Poland. Finally, although the registry included patients with DM and no CAD, about 7% of the patients with DM had concomitant clinical manifestation of arterial atherosclerosis in the form of peripheral artery disease.

In conclusion, the registry shows some differences in the level of adherence of primary care physicians in Poland to the guidelines on treatment of patients with DM and patients with CAD. While the majority of patients in both groups received guideline-recommended cardiovascular treatment (ACEIs, statins, ASA), use of statins and ASA was less frequent in patients with DM. Simple diagnostic tests to detect abnormalities in glucose metabolism in patients with CAD and to detect CAD in patients with DM were not performed in about 25% of the patients. Depending on how strict were the criteria of control of modifiable risk factors, there was a substantial proportion of both patients with DM and patients with CAD in whom the values of these risk factors were found to be too high. However, good control was more frequent in patients with CAD than in patients with DM.

Acknowledgements This study was financed by a scientific grant from Sanofi-Aventis Poland.

REFERENCES

1 [Clinical guidelines on the management of diabetic patients – 2009. Position statement of the Diabetes Poland]. Diabetologia Praktyczna. 2009; 9 (Suppl A): A1-A38. Polish.

2 Fox K, Garcia MA, Ardissino D, et al.; The Task Force on the Management of Stable Angina Pectoris of the European Society of Cardiology; ESC Committee for Practice Guidelines (CPG). Guidelines on the management of stable angina pectoris: executive summary: The Task Force on the Management of Stable Angina Pectoris of the European Society of Cardiology. Eur Heart J. 2006; 27: 1341-1381.

3 Brown LC, Johnson JA, Majumdar SR, et al. Evidence of suboptimal management of cardiovascular risk in patients with type 2 diabetes mellitus and symptomatic atherosclerosis. CMAJ. 2004; 171: 1189-1192.

4 Fu A, Zhang Q, Davies MJ, et al. Underutilization of statins in patients with type 2 diabetes in US clinical practice: a retrospective cohort study. Curr Med Res Opin. 2011; 27: 1035-1040.

5 Rydén L, Standl E, Bartnik M, et al.; Task Force on Diabetes and Cardiovascular Diseases of the European Society of Cardiology (ESC); European Association for the Study of Diabetes (EASD). Guidelines on diabetes, pre-diabetes, and cardiovascular diseases: executive summary. The Task Force on Diabetes and Cardiovascular Diseases of the European Society of Cardiology (ESC) and of the European Association for the Study of Diabetes (EASD). Eur Heart J. 2007; 28: 88-136.

6 Müller-Nordhorn J, Binting S, Roll S, Willich SN. An update on regional variation in cardiovascular mortality within Europe. Eur Heart J. 2008; 29: 1316-1326.

7 Chrostowska M, Szyndler A, Paczwa P, Narkiewicz K. Impact of abdominal obesity on the frequency of hypertension and cardiovascular disease in Poland – results from the IDEA study (International day for the evaluation of abdominal obesity). Blood Press. 2011; 20: 145-152.

8 American Diabetes Association. Diagnosis and classification of diabetes mellitus. Diabetes Care. 2010; 33 (Suppl 1): S62-S69.

9 Gitt AK, Jünger C, Jannowitz C, et al. Adherence of hospital-based cardiologists to lipid guidelines in patients at high risk for cardiovascular events (2L registry). Clin Res Cardiol. 2011; 100: 277-287.

10 European Association for Cardiovascular Prevention & Rehabilitation, Reiner Z, Catapano AL, De Backer G, et al. ESC/EAS Guidelines for the management of dyslipidaemias: the Task Force for the management of dyslipidaemias of the European Society of Cardiology (ESC) and the European Atherosclerosis Society (EAS). Eur Heart J. 2011; 32: 1769-1818.

11 Bała MM, Płaczkiewicz-Jankowska E, Topór-Mądry R, et al. Characteristics of patients with type 2 diabetes of short duration in Poland: rationale, design and preliminary results of the ARETAEUS1 study. Pol Arch Med Wewn. 2009; 119: 533-540.

12 Banasiak W, Pociupany R, Wilkins A, Ponikowski P. Characteristics of patients with coronary artery disease managed on an outpatient basis in the population of Poland. Results of the multicentre RECENT trial. Kardiol Pol. 2007; 65: 132-140.

13 Śliż D, Mamcarz A, Filipiak KJ, et al. 3ST-POL trial: standards of statin use in Poland in the context of the European Society of Cardiology guidelines. Pol Arch Med Wewn. 2010; 120: 328-333.

14 Michalak M, Kołtowski L, Jaworski R, et al. [Is treatment of hypercholesterolemia optimal? Results of the survey assessing ambulatory treatment of hypercholesterolemia in Poland]. Pol Przegl Kardiol. 2010; 12: 207-211. Polish.

15 Sacco M, Pellegrini F, Roncaglioni MC, et al.; PPP Collaborative Group. Primary prevention of cardiovascular events with low dose aspirin and vitamin E in type 2 diabetic patients: results of the Primary Prevention Project (PPP) trial. Diabetes Care. 2003; 26: 3264-3272.

16 Belch J, MacCuish A, Campbell I, et al. The prevention of progression of arterial disease and diabetes (POPADAD) trial: factorial randomized placebo controlled trial of aspirin and antioxidants in patients with diabetes and asymptomatic peripheral arterial disease. Br Med J. 2008; 337: a1840.

17 [Clinical guidelines on the management of diabetic patients - 2011. Position statement of the Diabetes Poland]. Diabetologia Praktyczna. 2011; 12 (Suppl A): A1-A46. Polish.

18 Cacoub PP, Zeymer U, Limbourg T, et al.; REACH Registry Investigators. Effects of adherence to guidelines for the control of major cardiovascular risk factors on outcomes in the REduction of Atherothrombosis for Continued Health (REACH) Registry Europe. Heart. 2011; 97: 660-667.

19 Mancia G, Laurent S, Agabiti-Rosel E, et al. Reappraisal of European guidelines on hypertension management: a European Society of Hypertension Task Force document. Blood Press. 2009; 18: 308-347.

20 Widecka K, Grodzicki T, Narkiewicz K, et al. [Principles of management of arterial hypertension - 2011. Guidelines of Polish Society of Hypertension]. Nadciśnienie Tętnicze. 2011; 15: 55-82. Polish.

ARTYKUŁ ORYGINALNY

Terapia sercowo-naczyniowa, procedury diagnostyczne i kontrola czynników ryzyka u pacjentów z cukrzycą lub chorobą wieńcową w Polsce – rejestr Kardia-Pol

Grzegorz Opolski[1], Krzysztof Strojek[2], Michał Kurzelewski[3], Maciej Ostrowski[3], Daniel Rabczenko[4]

1 I Katedra i Klinika Kardiologii, Warszawski Uniwersytet Medyczny, Samodzielny Publiczny Centralny Szpital Kliniczny, Warszawa
2 Śląskie Centrum Chorób Serca, Zabrze
3 Sanofi-Aventis Polska, Warszawa
4 Narodowy Instytut Zdrowia Publicznego – Państwowy Zakład Higieny, Warszawa

SŁOWA KLUCZOWE

czynniki ryzyka, procedury diagnostyczne, rejestr

STRESZCZENIE

WPROWADZENIE Cukrzyca (*diabetes mellitus* – DM) i choroba tętnic wieńcowych (*coronary artery disease* – CAD) wiążą się ze zwiększonym ryzykiem sercowo-naczyniowym.

CELE Celem badania było porównanie sposobów leczenia pacjentów wysokiego ryzyka z DM i pacjentów z CAD w Polsce.

PACJENCI I METODY W losowo wybranych gabinetach lekarzy pierwszego kontaktu włączano pacjentów w wieku ≥55 lat z DM bez udokumentowanej CAD (n = 210) lub z CAD bez udokumentowanej DM (n = 186).

WYNIKI Statyny otrzymało 64% *vs* 87% (p <0,05), kwas acetylosalicylowy (*acetylsalicylic acid* – ASA) – 53% *vs* 84% (p <0,05), a inhibitory enzymu konwertującego angiotensynę – 70% *vs* 69% (p = 0,8) pacjentów odpowiednio z DM i CAD. Badania przesiewowe w celu wykrycia zaburzeń gospodarki węglowodanowej u pacjentów z CAD lub w celu wykrycia CAD u pacjentów z DM nie były wykonywane u 26% pacjentów z DM i 24% pacjentów z CAD (p = 0,64). Średnie skurczowe ciśnienie tętnicze wynosiło 136,8 ±13,6 *vs* 131,7 ±15,8 mm Hg (p = 0,001), ciśnienie rozkurczowe wynosiło 80,4 ±7,4 *vs* 79,4 ±11,6 mm Hg (p = 0,316), a stężenie cholesterolu całkowitego 196 ±42 *vs* 183 ±42 mg/dl (p = 0,003) u pacjentów odpowiednio z DM i CAD. Odsetek pacjentów, u których uzyskano ciśnienie tętnicze <140/90 mm Hg, stężenie cholesterolu całkowitego <175 mg/dl i stężenie cholesterolu frakcji lipoprotein o małej gęstości (*low-density lipoprotein* – LDL) <100 mg/dl wynosił 15% *vs* 25% (p = 0,055), natomiast odsetek pacjentów, u których uzyskano ciśnienie tętnicze <130/80 mm Hg, stężenie cholesterolu całkowitego <175 mg/dl i stężenie cholesterolu LDL <70 mg/dl wynosił 1% *vs* 3% (p = 0,016) odpowiednio w grupie pacjentów z DM i CAD.

WNIOSKI U pacjentów z CAD stosowano statyny i ASA częściej niż u pacjentów z DM. Kontrola czynników ryzyka była lepsza w grupie CAD, ale wciąż pozostawała niezadowalająca u większości pacjentów.

Adres do korespondencji:
prof. dr hab. med. Grzegorz Opolski, I Katedra i Klinika Kardiologii, Warszawski Uniwersytet Medyczny, Samodzielny Publiczny Centralny Szpital Kliniczny, ul. Banacha 1a, 02-097 Warszawa, tel: 22-599-19-58, fax: 22-599-19-57, e-mail: grzegorz.opolski@wum.edu.pl
Praca wpłynęła: 16.05.2012.
Przyjęta do druku: 09.07.2012.
Publikacja *online*: 19.07.2012.
Zgłoszono sprzeczność interesów: Wszyscy autorzy wzięli udział w rejestrze finansowanym przez grant od firmy Sanofi-Aventis. M.K. jest pracownikiem firmy Sanofi-Aventis Polska, a M.O. był pracownikiem Sanofi-Aventis Polska w czasie przeprowadzania badania.
Pol Arch Med Wewn. 2012; 122 (9): 413-421