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Management of coronary artery disease patients in Latvia compared with practice in Central-Eastern Europe and globally: Analysis of the CLARIFY registry

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ABSTRACT

Background and objective: Management of outpatients with stable coronary artery disease (CAD) is important in secondary prevention. The objective was to describe differences in the characteristics of CAD patients in Latvia compared with other countries.

Materials and methods: CLARIFY is an ongoing international, prospective, observational, longitudinal registry of outpatients with CAD. Data regarding treated outpatients with established CAD from the CLARIFY registry in Latvia ($n = 120$) were compared with those from the rest of Central-Eastern Europe (CEE) ($n = 2888$) and worldwide ($n = 33{,}163$).

Results: Patients in Latvia had a larger waist circumference (101 [95–109] vs. 99 [91–106] in CEE, 96.5 [88–105] cm worldwide; $P = 0.023$ and $P < 0.001$, respectively) and higher blood pressure (systolic: 138.28 ± 17.13 vs. 133.77 ± 16.47 in CEE and 130.97 ± 16.65 mm Hg worldwide, $P = 0.003$ and $P < 0.001$; diastolic: 82.98 ± 8.58 vs. 80.01 ± 9.61 in CEE and 77.22 ± 9.97 mm Hg worldwide, $P < 0.001$ and $P < 0.001$, respectively). Body mass index in Latvia did not differ significantly from that in CEE ($P = 0.422$), but was higher than worldwide (28.8 [26.2–32.0] vs. worldwide 27.3 [24.8–30.3] kg/m^2, $P < 0.001$). The history of percutaneous coronary intervention was more frequent in Latvia (74.17% vs. 59.34% in CEE and 58.61% worldwide, $P = 0.001$ and $P < 0.001$, respectively). Latvian patients more frequently used

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aspirin (97.50% in Latvia vs. 89.75% in CEE and 87.64% worldwide, $P = 0.005$ and $P = 0.001$, respectively).

Conclusions: Latvian CAD patients are well managed in terms of aspirin use and frequency of percutaneous coronary intervention. Control of obesity and high BP is poorer and needs further improvement.

1. Introduction

Coronary artery disease (CAD) is a highly prevalent cardiovascular (CV) disease and the main cause of mortality worldwide [1]. In terms of CV diseases the epidemiological situation is on average less favorable in Latvia than in the European Union [2]. Population aging and improved prognosis of coronary patients may increase the number of CAD patients in the future [3]. Despite the presence of country- and region-specific differences in the characteristics and management of CAD patients, there is a lack of data regarding the situation in Latvia vs the rest of Central-Eastern Europe and worldwide data. The prospeCtive observationaL LongitudinAl RegIstry oF patients with stable coronary arterY disease (CLARIFY) registry was initiated to gather additional knowledge regarding outpatients with stable CAD: to describe the population of treated outpatients with stable CAD (demographics, risk factors, management, outcomes), to identify discrepancies between evidence-based recommendations and routine treatment in practice, and to identify long-term prognostic determinants in CAD outpatients [4]. A better understanding of the situation of risk factor control and the management and treatment of CAD patients in Latvia, taking into account the position of Latvia among other countries, would help to define the areas requiring further improvement for successful secondary prevention. The objective of the study was to describe geographical and international differences in the characteristics of treated stable CAD patient populations by comparison of data from CLARIFY Latvia and CLARIFY Central-Eastern Europe, and from worldwide populations.

2. Materials and methods

The CLARIFY is an ongoing international, prospective, observational, longitudinal registry of outpatients with established CAD, in which patients are followed up for 5 years. A total of 33,283 patients from 45 countries worldwide were included in the registry [5]. The rationale of the registry, its methods, and its worldwide baseline data have been published previously [4,5]. Patients were eligible for enrollment if at least one of the inclusion criteria was present: documented myocardial infarction (more than 3 months ago), coronary stenosis of more than 50% on coronary angiography, chest pain in combination with myocardial ischemia (confirmed by stress electrocardiogram [ECG], stress echocardiography or myocardial imaging), coronary revascularization (coronary artery bypass graft or percutaneous coronary intervention [PCI]) at least 3 months ago. Exclusion criteria were hospitalization due to CV disease within the last 3 months, planned revascularization, and conditions expected to interfere with participation or 5-year follow-up.

In Latvia, 120 patients were included in the CLARIFY registry during 2009–2010. Patients were managed by physicians according to usual clinical practice at each institution with no specific tests or treatment changes defined in the protocol. Approval was obtained from the Ethics Committee of the Research Institute of Cardiology, University of Latvia, before enrollment of patients in the registry in Latvia.

During a baseline visit, the following data were collected: demographic information, medical history, risk factors and lifestyle, physical examination data, heart rate (measured by both pulse palpation and ECG), current symptoms, most recent laboratory values, as well as information about current medical treatment. Heart rate by pulse palpation was measured for 30 s after sitting for at least 5 min in a quiet room at comfortable temperature. Of two different measurements, the second was recorded. Blood pressure was measured in sitting position after being at rest at least 5 min. The most recent (within 6 months) 12-lead ECG was analyzed. For assessment of heart failure symptoms, the New York Heart Association (NYHA) classification was used. Laboratory values were collected if data were available. Data were collected by using standardized, international case report forms translated into the local language. Completed electronic case report forms using these data were sent to the data management center in Glasgow.

In order to understand between-country differences in the characteristics and management of patients with stable CAD, CLARIFY Latvia data from baseline visit were compared with the data from other Central-Eastern Europe countries, as well with global data. The total number of patients enrolled in CLARIFY in Central-Eastern Europe was 3008. Latvia was compared with the rest of Central-Eastern Europe ($n = 2888$) (Bulgaria, Czech Republic, Hungary, Lithuania, Poland, Romania, Slovakia, Slovenia), as well as with the other countries involved ($n = 33,163$). Apart from Central-Eastern Europe, global data included information also from Western Europe (Belgium, Denmark, France, Germany, Greece), North America (Canada), Central America (Mexico), West Indies, South America (Argentina, Brazil), Africa, Middle East (Bahrain, Kuwait, Oman, Qatar, UAE, and Saudi Arabia), Russia, Ukraine, Asia (Brunei, China, India, Korea, Malaysia, Singapore, Thailand, Vietnam), and Australasia (Australia).

Table 1 – Baseline characteristics of the study population classified according to Latvia vs rest of Central-Eastern Europe and Latvia vs rest of world.

Parameter	Total Central-Eastern Europe (n = 3008)	Total worldwide (n = 33,283)	Population			P (Latvia vs other Central-Eastern European countries)	P (Latvia vs rest of world)
			Latvia (n = 120)	Other Central-Eastern European countries (n = 2888)	Rest of world (n = 33,163)		
Age, years mean ± SD	62.43 ± 9.43	64.15 ± 10.48	64.19 ± 7.95	62.35 ± 9.48	64.15 ± 10.49	0.037*	0.966
Men, n (%)	2196 (73.20)	25,761 (77.49)	87 (72.50)	2109 (73.23)	25,674 (77.50)	0.860	0.190
Body mass index, kg/m^2, median (Q1–Q3)	28.6 (26.1–31.5)	27.3 (24.8–30.3)	28.8 (26.2–32.0)	28.6 (26.1–31.4)	27.3 (24.8–30.3)	0.422	<0.001***
Waist circumference, cm, median (Q1–Q3)	99.0 (91.0–106.0)	96.5 (88.0–105.0)	101.0 (95.0–109.0)	99.0 (91.0–106.0)	96.5 (88.0–105.0)	0.023*	<0.001***
Medical history, n (%)							
Myocardial infarction	2011 (67.03)	19,849 (59.70)	76 (63.33)	1935 (67.19)	19,773 (59.69)	0.379	0.416
PCI	1798 (59.93)	19,506 (58.67)	89 (74.17)	1709 (59.34)	19,417 (58.61)	0.001**	<0.001***
CABG	818 (27.28)	7784 (23.41)	29 (24.17)	789 (27.41)	7755 (23.41)	0.435	0.845
ICD	41 (1.37)	414 (1.25)	0 (0.00)	41 (1.42)	414 (1.25)	0.410	0.410
Pacemaker	76 (2.53)	796 (2.39)	3 (2.50)	73 (2.53)	793 (2.39)	1.000	0.765
Hospitalization for CHF	178 (5.93)	1552 (4.67)	2 (1.67)	176 (6.11)	1550 (4.68)	0.044*	0.119
Stroke	152 (5.07)	1327 (3.99)	3 (2.50)	149 (5.17)	1324 (4.00)	0.191	0.636
Atrial fibrillation/flutter	239 (7.97)	2328 (7.00)	12 (10.00)	227 (7.88)	2316 (6.99)	0.401	0.197
Asthma/COPD	193 (6.44)	2453 (7.38)	7 (5.83)	186 (6.46)	2446 (7.38)	0.784	0.517
Risk factors and lifestyle, n (%)							
Family history of premature CAD[a]	991 (33.07)	9461 (28.46)	29 (24.17)	962 (33.44)	9432 (28.48)	0.034*	0.296
Treated hypertension	2458 (81.93)	23,591 (70.96)	94 (78.33)	2364 (82.08)	23,497 (70.93)	0.296	0.075
Diabetes	844 (28.13)	9696 (29.16)	25 (20.83)	819 (28.44)	9671 (29.19)	0.070	0.044*
Dyslipidemia	2651 (88.37)	24,889 (74.86)	113 (94.17)	2538 (88.13)	24,776 (74.79)	0.043*	<0.001***
PAD	306 (10.21)	3255 (9.79)	8 (6.67)	298 (10.35)	3247 (9.80)	0.191	0.249
Smoking status, n (%)							
Current	367 (12.25)	4126 (12.41)	21 (17.50)	346 (12.03)	4105 (12.39)	0.054	0.215
Former	1516 (50.60)	15,093 (45.40)	49 (40.83)	1467 (51.01)	15,044 (45.41)		
Never	1113 (37.15)	14,029 (42.20)	50 (41.67)	1063 (36.96)	13,979 (42.20)		
Alcohol intake, drinks per week, n (%)							
0	1134 (37.83)	16,082 (48.38)	38 (31.67)	1096 (38.08)	16,044 (48.44)	0.233	<0.001***
>0 and <20	1805 (60.21)	15,977 (48.06)	78 (65.00)	1727 (60.01)	15,899 (48.00)		
20+	59 (1.97)	1184 (3.56)	4 (3.33)	55 (1.91)	1180 (3.56)		
Stimulant drinks consumed, n (%)							
Coffee	1740 (58.10)	15,657 (47.14)	71 (59.17)	1669 (58.05)	15,586 (47.09)	<0.001***	<0.001***
Tea	891 (29.75)	10,186 (30.67)	47 (39.17)	844 (29.36)	10,139 (30.64)		
Neither	364 (12.15)	7373 (22.20)	2 (1.67)	362 (12.59)	7371 (22.27)		
Daily intake of stimulant drinks (cups per day), median (Q1–Q3)	2 (1–3)	2 (2–4)	2 (1–3)	2 (1–3)	2 (2–4)	0.042*	<0.001***
Physical activity							
None	275 (9.17)	5419 (16.30)	8 (6.67)	267 (9.27)	5411 (16.34)	0.024*	<0.001***
Light[b]	1555 (51.83)	17,057 (51.31)	55 (45.83)	1500 (52.08)	17,002 (51.33)		
1–2 times per week[c]	591 (19.70)	5578 (16.78)	21 (17.50)	570 (19.79)	5557 (16.78)		
≥3 times per week[c]	579 (19.30)	5187 (15.60)	36 (30.00)	543 (18.85)	5151 (15.55)		
Current symptoms, n (%)							
Angina	979 (32.63)	7315 (22.00)	57 (47.50)	922 (32.01)	7258 (21.91)	<0.001***	<0.001***
CHF symptoms							
None	2365 (78.83)	28,298 (85.13)	51 (42.50)	2314 (80.35)	28,247 (85.28)	<0.001***	<0.001***
NYHA II	529 (17.63)	4135 (12.44)	62 (51.67)	467 (16.22)	4073 (12.30)		
NYHA III	106 (3.53)	808 (2.43)	7 (5.83)	99 (3.44)	801 (2.42)		
Creatinine, mmol/L, median (Q1–Q3)	0.087 (0.075–0.100)	0.088 (0.076–0.102)	0.085 (0.073–0.100)	0.087 (0.075–0.100)	0.088 (0.076–0.102)	0.752	0.392
Blood glucose, mmol/L, median (Q1–Q3)	5.7 (5.2–6.6)	5.7 (5.1–6.6)	5.7 (5.2–6.4)	5.7 (5.2–6.6)	5.7 (5.1–6.6)	0.950	0.857

Total cholesterol, mmol/L, median (Q1–Q3)	4.6 (3.9–5.4)	4.3 (3.7–5.0)	4.5 (3.9–5.1)	4.6 (3.9–5.4)	4.3 (3.7–5.0)	0.3190	0.0520
HDL-C, mmol/L, median (Q1–Q3)	1.19 (1.00–1.41)	1.14 (0.96–1.37)	1.21 (1.01–1.56)	1.19 (1.00–1.40)	1.14 (0.96–1.37)	0.155	0.008**
LDL-C, mmol/L, median (Q1–Q3)	2.60 (2.03–3.30)	2.37 (1.90–2.94)	2.58 (1.97–3.09)	2.60 (2.03–3.30)	2.37 (1.90–2.94)	0.419	0.060
Triglycerides, mmol/L, median (Q1–Q3)	1.5 (1.1–2.1)	1.4 (1.0–1.9)	1.4 (1.0–2.0)	1.5 (1.1–2.1)	1.4 (1.0–1.9)	0.204	0.880
Heart rate (palpation), bpm, mean ± SD	69.14 ± 10.02	68.29 ± 10.62	67.96 ± 9.65	69.19 ± 10.03	68.29 ± 10.62)	0.188	0.733
ECG heart rate, bpm, mean ± SD	68.25 ± 11.05	67.18 ± 11.44	67.17 ± 10.88	68.30 ± 11.05	67.18 ± 11.45	0.274	0.993
SBP (mm Hg), mean ± SD	133.95 ± 16.52	131.00 ± 16.66	138.28 ± 17.13	133.77 ± 16.47	130.97 ± 16.65	0.003**	<0.001***
DBP (mm Hg), mean ± SD	80.13 ± 9.58	77.24 ± 9.97	82.98 ± 8.58	80.01 ± 9.61	77.22 ± 9.97	<0.001***	<0.001***
LVEF (%), mean ± SD	53.15 ± 9.75	56.11 ± 11.09	57.07 ± 8.70	52.99 ± 9.76	56.10 ± 11.10	<0.001***	0.392
Presence of coronary stenosis >50%, *n* (%)							
Left main stenosis[d]	161 (5.35)	2865 (8.61)	13 (10.83)	148 (5.12)	2852 (8.60)	0.007**	0.384
LAD stenosis[d]	1739 (57.81)	19,321 (58.05)	83 (69.17)	1656 (57.34)	19,238 (58.01)	0.010*	0.013*
Cx stenosis[d]	1118 (37.17)	11,924 (35.83)	56 (46.67)	1062 (36.77)	11,868 (35.79)	0.028*	0.013*
RCA stenosis[d]	1347 (44.78)	14,368 (43.17)	73 (60.83)	1274 (44.11)	14,295 (43.11)	<0.001***	<0.001***
CABG stenosis[d]	249 (8.28)	2657 (7.98)	19 (15.83)	230 (7.96)	2638 (7.95)	0.002**	0.002**
No stenosis	93 (3.09)	1070 (3.21)	1 (0.83)	92 (3.19)	1069 (3.22)	0.182	0.191
Coronary angiography not done	442 (14.69)	4867 (14.62)	7 (5.83)	435 (15.06)	4860 (14.65)	0.005**	0.006**
Test for myocardial ischemia[e], *n* (%)	2018 (67.29)	20,581 (61.93)	108 (90.00)	1910 (66.34)	20,473 (61.83)	<0.001***	<0.001***
Current evidence of ischemia, *n* (%)	635 (21.17)	5369 (16.16)	8 (6.67)	627 (21.78)	5361 (16.19)	<0.001***	0.005**
ECG rhythm, *n* (%)							
Sinus rhythm	2539 (95.13)	23,382 (94.94)	113 (94.96)	2426 (95.14)	23,269 (94.94)	0.940	0.945
Atrial fibrillation/flutter	77 (2.88)	841 (3.41)	4 (3.36)	73 (2.86)	837 (3.42)		
Paced rhythm	53 (1.99)	404 (1.64)	2 (1.68)	51 (2.00)	402 (1.64)		

n, number of patients; Y, years; SD, standard deviation; PCI, percutaneous coronary intervention; CABG, coronary artery bypass graft; ICD, internal cardiac defibrillator; CHF, chronic heart failure; COPD, chronic obstructive pulmonary disease; CAD, coronary artery disease; PAD, peripheral arterial disease; NYHA, New York Heart Association; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; bpm, beats per minute; ECG, electrocardiogram; SBP, systolic blood pressure; DBP, diastolic blood pressure; LVEF, left ventricular ejection fraction; LAD, left anterior descending; Cx, circumflex; RCA, right coronary artery.

[a] Myocardial infarction, sudden death, stable angina at age <55 years (men) or 65 years (women) in a first-degree relative.

[b] Light physical activity most weeks.

[c] At least 20 min vigorous physical activity.

[d] Coronary territories with stenosis >50% at coronary angiography or having required revascularization in the past.

[e] Noninvasive test for myocardial ischemia (stress ECG, stress echocardiography, myocardial imaging).

* $P < 0.05$.

** $P < 0.01$.

*** $P < 0.001$.

All CLARIFY data are stored and analyzed at the Robertson Centre for Biostatistics, University of Glasgow, UK. Continuous data are summarized using mean and standard deviation (SD), or median and interquartile range (IQR) depending on the distribution of data. Categorical data are summarized using counts and percentages. Summaries are provided for CLARIFY Latvia, Central-Eastern Europe, as well as global data. In order to analyze clinical characteristics and medications according to population (Latvia vs rest of Central-Eastern Europe or Latvia vs rest of global data), *P* values for between-group differences were calculated using either the chi-square or Fisher exact tests for categorical variables, depending on the data, and for continuous variables using either one-way analysis of variance or the Kruskal–Wallis test, depending on the distribution of the data. Statistical analyses were performed using Statistical Analysis Software (version 9.2). A significance level of 0.05 was used to test for statistical differences throughout and all tests used were two-sided.

Height and weight were used to calculate body mass index in kg/m^2.

3. Results

The characteristics of the CLARIFY population in Latvia in comparison with the population of the rest of Central-Eastern Europe and the rest of world population are summarized in Table 1. CLARIFY patients in Latvia were significantly older than in the rest of Central-Eastern Europe and with a higher body mass index than the rest of the CLARIFY worldwide population (Table 1). Mean waist circumference of patients was larger in Latvia. Latvian patients more frequently had a history of PCI than patients in the rest of Central-Eastern Europe or worldwide (Table 1). Significantly fewer patients were hospitalized due to heart failure in Latvia vs the rest of Central-Eastern Europe (Table 1). CLARIFY patients in Latvia less frequently had a family history of premature CAD in comparison with the rest of Central-Eastern Europe and less frequently had diabetes in comparison with the rest of worldwide population, whereas a larger proportion of patients had dyslipidemia in Latvia than in the rest of Central-Eastern Europe or in the worldwide population (Table 1). Alcohol intake was higher in Latvia than worldwide (the higher moderate alcohol intake of between 0 and 20 drinks per week rather than +20 drinks per week). Patients used more stimulant drinks (tea, coffee) and were more physically active in Latvia than in the rest of Central-Eastern Europe and worldwide (Table 1). When analyzing current symptoms, angina, as well as symptoms of heart failure, was more frequent in the Latvian population than in the rest of Central-Eastern Europe or worldwide (Table 1). The level of high-density lipoprotein cholesterol was higher in Latvian patients vs the CLARIFY population worldwide (Table 1). Mean heart rate did not differ significantly, but systolic blood pressure and diastolic blood pressure were higher in Latvia vs other Central-Eastern European countries and worldwide (Table 1). Left ventricular ejection fraction was greater in Latvia than in other Central-Eastern European countries (Table 1). In Latvia there were fewer people in whom coronary angiography was not done. Coronary stenosis >50% was more frequent in Latvia than in the rest of Central-Eastern Europe or worldwide (the exception was left main stenosis which differed from other Central-Eastern European countries but not from other countries worldwide) (Table 1). Tests for myocardial ischemia was more frequently done in the Latvian population, but there were significantly fewer patients with current evidence of ischemia than in the rest of Central-Eastern Europe or in the CLARIFY population worldwide (Table 1).

Medications taken by the Latvian patients vs. the rest of Central-Eastern Europe and worldwide are summarized in Table 2. CLARIFY patients in Latvia were more frequently on aspirin, calcium antagonists (dihydropyridines) and antiarrhythmics, but less frequently on other antiplatelet drugs. A larger proportion of Latvian patients had symptoms indicative of intolerance or contraindication to beta-blockers when compared with the rest of Central-Eastern Europe and worldwide (Table 2). A significantly smaller proportion of Latvian patients were using beta-blockers, oral anticoagulants, verapamil or diltiazem, other antianginal agents, and diuretics than in the rest of Central-Eastern Europe (Table 2). When comparing Latvian data with the CLARIFY worldwide data, angiotensin-converting enzyme inhibitors or angiotensin II receptor blockers were more frequently used in Latvia, while the proportion of patients on thienopyridine was higher in the rest of worldwide population (Table 2).

4. Discussion

Comparison of the Latvian CLARIFY population with CLARIFY patients from the rest of Central-Eastern Europe and worldwide shows several directions for further improvement of secondary prevention in CAD patients in Latvia, and highlights areas where Latvian physicians are successful.

A population-based cross-sectional study of cardiovascular risk factors in Latvia showed that dyslipidemia is the most frequent cardiovascular risk factor in the general population as it was present in 75.2% of analyzed adult responders ($n = 3807$) and in 81.9% of men in the age group 65–74 years ($n = 929$) [6]. High prevalence of dyslipidemia in the Latvian general population may explain why this risk factor is frequently found among CAD patients. In the Latvian CLARIFY sample the prevalence of dyslipidemia is significantly higher than in other Central-Eastern Europe countries or worldwide. However, it may be that Latvian physicians more frequently recognize dyslipidemia as a risk factor, because the levels of total cholesterol and low-density lipoprotein cholesterol did not differ significantly. The level of high-density lipoprotein cholesterol in the CLARIFY Latvia population is higher than in the worldwide population and could be linked to a higher level of physical activity in Latvian patients. Use of lipid-lowering agents is high in the Latvian CLARIFY population and in the rest of Central-Eastern Europe and worldwide. At the beginning of the 21st century use of statins in CAD patients was extremely low. In a study in Latvia in 2002, only 29% of 403 CAD patients analyzed were using lipid-lowering drugs [7]. That 95% of Latvian CLARIFY patients are now treated with lipid-lowering drugs is a great achievement.

Our analysis shows not only a good proportion of patients taking lipid-lowering agents, but also good frequency of use of

Table 2 – Medications of the study population classified according to Latvia vs rest of Central-Eastern Europe and Latvia vs rest of world.

Parameter	Total Central-Eastern Europe (n = 3008)	Total worldwide (33,283)	Population			P (Latvia vs other Central-Eastern European countries)	P (Latvia vs rest of world)
			Latvia (n = 120)	Other Central-Eastern European countries (n = 2888)	Rest of world (33,163)		
Aspirin, n (%)	2700 (90.06)	29,144 (87.68)	117 (97.50)	2583 (89.75)	29,027 (87.64)	0.005**	0.001**
Thienopyridine, n (%)	612 (20.43)	9036 (27.22)	18 (15.00)	594 (20.65)	9018 (27.26)	0.132	0.003**
Other antiplatelet drugs, n (%)	207 (6.91)	3084 (9.29)	1 (0.83)	206 (7.16)	3083 (9.32)	0.007**	0.001**
Oral anticoagulants, n (%)	287 (9.57)	2737 (8.24)	4 (3.33)	283 (9.83)	2733 (8.26)	0.018*	0.050
Beta-blockers, n (%)	2670 (89.03)	24,984 (75.16)	98 (81.67)	2572 (89.34)	24,886 (75.13)	0.008**	0.098
Symptoms indicative of intolerance or contraindication to beta-blockers, n (%)	435 (14.50)	4797 (14.43)	25 (20.83)	410 (14.24)	4772 (14.41)	0.045*	0.046*
Ivabradine, n (%)	275 (9.17)	3268 (9.83)	14 (11.67)	261 (9.07)	3254 (9.82)	0.334	0.499
Calcium antagonists, n (%)	863 (28.79)	9059 (27.25)	65 (54.17)	798 (27.73)	8994 (27.16)	<0.001***	<0.001***
Verapamil or diltiazem	109 (3.64)	1933 (5.82)	0 (0.00)	109 (3.79)	1933 (5.84)	0.022*	0.006**
ACE inhibitors/angiotensin II receptor blockers n (%)	2614 (87.19)	25,275 (76.04)	103 (85.83)	2511 (87.25)	25,172 (76.00)	0.650	0.012*
Lipid-lowering drugs, n (%)	2845 (94.86)	30,688 (92.31)	114 (95.00)	2731 (94.86)	30,574 (92.30)	0.946	0.269
Long-acting nitrates, n (%)	584 (19.48)	7359 (22.14)	28 (23.33)	556 (19.32)	7331 (22.13)	0.277	0.752
Other antianginal agents, n (%)	726 (24.22)	4639 (13.96)	15 (12.50)	711 (24.70)	4624 (13.96)	0.002**	0.644
Diuretics, n (%)	1174 (39.17)	9715 (29.23)	31 (25.83)	1143 (39.73)	9684 (29.24)	0.002**	0.412
Other antihypertensive agents, n (%)	275 (9.17)	2281 (6.86)	11 (9.17)	264 (9.17)	2270 (6.85)	0.998	0.317
Digoxin and derivatives, n (%)	87 (2.90)	838 (2.52)	3 (2.50)	84 (2.92)	835 (2.52)	1.000	1.000
Amiodarone/dronedarone, n (%)	95 (3.17)	972 (2.92)	5 (4.17)	90 (3.13)	967 (2.92)	0.430	0.405
Other antiarrythmics, n (%)	26 (0.87)	311 (0.94)	4 (3.33)	22 (0.76)	307 (0.93)	0.018*	0.027*
Antidiabetic agents, n (%)	640 (21.35)	8182 (24.61)	2 (19.17)	617 (21.44)	8159 (24.63)	0.552	0.165

n, number of patients; ACE, angiotensin-converting enzyme.
* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

other preventive treatments. For example, the number of CLARIFY patients on aspirin is higher in Latvia than in other Central-Eastern European countries and worldwide, and the usage of angiotensin-converting enzyme inhibitors is more frequent than worldwide.

Current analysis also shows that CAD patients in Latvia are well managed in some other regards. The proportion of CLARIFY patients with PCI is significantly high in Latvia, although one cannot exclude selection bias. In spite of a significantly lower rate of ischemic symptoms among CLARIFY Latvia patients, testing for ischemia was more frequent than in other countries, showing that physicians are willing to examine CAD patients on a regular basis.

However, there are areas for further improvement in the management and treatment of CAD in Latvia. CLARIFY patients in Latvia have a larger waist circumference and higher body mass index despite higher levels of physical activity than in other countries. This indicates a need for improvement in eating habits and further increase in physical exercise. Greater use of stimulant drinks (coffee and tea) and alcohol in the CLARIFY Latvia population raises the question of whether there is a need for further education of patients.

The mean blood pressure in CLARIFY Latvia patients is higher than in other countries. Relatively low rate of treated CAD with controlled blood pressure in Latvia (41.4%) was also seen in EUROASPIRE III [8], and indicates a need to improve the treatment of hypertension in Latvian CAD patients.

The current analysis gives an objective view of the level of CAD management in Latvia, taking into account the global context. Our study findings will help practitioners to further improve the management of CAD outpatients in Latvia and therefore to succeed in secondary prevention.

Limitations on data interpretation should be acknowledged as the analyzed sample of CAD patients in Latvia is relatively small. There may also have been selection bias. The surveyed population may therefore not fully reflect the situation in the total population of stable CAD patients in Latvia. For a better understanding of the characteristics, management, and treatment of CAD patients in Latvia, studies with a larger number of patients are necessary.

5. Conclusions

Latvian CAD patients are well managed in several regards, such as use of aspirin and frequency of PCI. Control of obesity and high blood pressure is poorer in Latvia and needs further improvement.

Conflict of interest

A.E. has research contracts with Abbott Vascular and Boston Scientific has received lecturer's fees from Abbott Laboratories, Abbott Vascular, AstraZeneca, Berlin Chemie, Biosensors, Boehringer Ingelheim, Boston Scientific, Cordis J&J, Grindekss, Medtronic, Pfizer, Sanofi Aventis, and Servier; I.M. has received lecturer's fees or research grants from Pfizer, AstraZeneca, Servier, Abbott Laboratories, Berlin Chemie, Bayer, Boehringer Ingelheim, and Merck Sharp and Dohme; G.L. has received lecturer's fees or research grants from Pfizer, AstraZeneca, Servier, Abbott Laboratories, GlaxoSmithKline, Berlin Chemie, Novo Nordisk, Bayer, Boehringer Ingelheim, Sanofi Aventis, and Merck Sharp and Dohme, and is an advisory board member for Boehringer Ingelheim, Pfizer, and Berlin Chemie; I. B. is employed by Servier Latvia; S.J. has received lecturer's fees from Abbott Laboratories, AstraZeneca, Berlin Chemie, Pfizer, Sanofi Aventis, and Servier; I.B., A.R., and N.G. state no conflict of interest; R.F. has received lecturer's fees from Servier, Roche; B.I. has received research grants from Servier, Boehringer Ingelheim, and Roche, and is on the Advisory Boards of Servier, Bayer, Roche, and Boehringer Ingelheim; P.G.S. has received compensation from Amarin, AstraZeneca, Bayer, Bristol-MyersSquibb, Boehringer-Ingelheim, Daiichi-Sankyo, GlaxoSmithKline, Merck, Novartis, Otsuka, Pfizer, Roche, Sanofi, and Servier, is a member of steering committees, data monitoring committees, and event committees, and has performed consulting activities, for The Medicines Company and Vivus, and has received research grants (to institution) from Sanofi and Servier.

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