ORIGINAL ARTICLE

Management strategies and 5-year outcomes in Polish patients with stable coronary artery disease versus other European countries: data from the CLARIFY registry

Zofia Parma[1], Robin Young[2], Tomasz Roleder[1], Miłosz Marona[3], Ian Ford[2], Michał Tendera[1], Philippe G. Steg[4,5,6,7], Janina Stępińska[3]

1 Department of Cardiology and Structural Heart Diseases, School of Medicine in Katowice, Medical University of Silesia, Katowice, Poland
2 Robertson Centre for Bioststistics, University of Glasgow, Glasgow, United Kingdom
3 Institute of Cardiology, Warsaw, Poland
4 FACT, French Alliance for Cardiovascular Trials, Paris, France
5 Bichat Hospital, Assistance Publique-Hopitaux de Paris, Paris, France
6 INSERM U-1148, Laboratory for Vascular Translational Science, Paris, France
7 National Heart and Lung Institute, Royal Brompton Hospital, Imperial College, London, United Kingdom

KEY WORDS

CLARIFY registry, geographical differences, management, outcome, stable coronary artery disease

ABSTRACT

INTRODUCTION An international registry of ambulatory patients with stable coronary artery disease (CLARIFY) allows a comparison of management and outcomes in real-life setting.

OBJECTIVES We aimed to compare the management strategies and 5-year outcomes in patients from Poland and from other European countries.

PATIENTS AND METHODS Stable coronary artery disease was defined as previous myocardial infarction (MI) or revascularization, coronary stenosis greater than 50%, or documented symptomatic myocardial ischemia. Patients were followed on an annual basis for 5 years.

RESULTS Among the total of 32 703 patients, 1000 were enrolled in Poland, and 17 326 in other European countries. Polish patients were younger, with a higher proportion of women, smokers, and patients with previous MI, dyslipidemia, and hypertension. Patients in both cohorts received adequate medical treatment, with more Polish patients receiving β-blockers. Blood pressure and lipid control to target was similar and remained low in both cohorts. Diabetes control and successful smoking cessation rates were lower in Poland than in other European countries. Polish patients more often underwent percutaneous coronary intervention. All-cause (8.5% vs 7.9%; $P = 0.81$) and cardiovascular death rates (5.3% vs 4.9%; $P = 0.82$) did not differ between the groups, but fatal or nonfatal MI occurred more often in the Polish cohort (5% vs 3.1%; $P = 0.006$). Angina control was better in Poland than in other European countries (Canadian Cardiovascular Society class II-IV, 11.5% vs 15.8% of patients; $P < 0.001$).

CONCLUSIONS Risk factor control was insufficient both in patients from Poland and in those from other European countries. The more frequent use of revascularization in Polish patients was not linked to improved outcomes, but, together with more extensive prescription of β-blockers, might have contributed to better angina control.

Correspondence to:
Zofia Parma, MD, Department of Cardiology and Structural Heart Diseases, Medical University of Silesia in Katowice, ul. Ziołowa 45/47, 40-635 Katowice, Poland, phone: +48 32 252 39 30, email: zofia.parma@gmail.com
Received: February 5, 2019.
Revision accepted: April 5, 2019.
Published online: April 5, 2019.
Pol Arch Intern Med. 2019; 129 (5): 327-334
doi:10.20452/pamw.14789

INTRODUCTION Stable coronary artery disease (SCAD) is a growing global medical and social problem[1] due to population aging and increasing survival of patients with acute coronary syndromes. The risk of major adverse cardiovascular events in patients with SCAD depends on various factors, such as age, risk factor control, left ventricular function, kidney dysfunction, presence of angina, or the model of patient care.[2-5] Treatment strategies may

differ between regions and countries and may affect clinical outcomes.[6]

In addition, over the last decades, the clinical profile of patients with SCAD has considerably evolved.[7] The CLARIFY registry (Prospective Observational Longitudinal Registry of Patients with Stable Coronary Artery Disease) was an international registry of ambulatory patients, which aimed to describe the contemporary population of patients with SCAD, identify gaps between evidence-based recommendations and actual treatment, and establish determinants of outcome.[8,9] The aim of the current analysis was to compare management strategies and long-term clinical outcomes between patients from Poland and other European countries.

PATIENTS AND METHODS

Study design

The rationale, design, and baseline characteristics of the entire CLARIFY population have been published elsewhere.[9] CLARIFY participants were enrolled from 45 countries worldwide between November 2009 and June 2010. In order to be eligible for the study, the patients had to fulfill at least one of the following criteria: previous myocardial infarction (MI), history of myocardial revascularization (coronary artery bypass surgery or percutaneous coronary intervention [PCI]), coronary stenosis greater than 50%, or documented symptomatic myocardial ischemia. The main exclusion criteria were hospitalization for cardiovascular disease within the previous 3 months, planned revascularization, and serious conditions that might affect the 5-year outcome.

In each country, study sites were selected by national coordinators according to predefined criteria that aimed to reflect the burden of SCAD. Participating physicians were asked to manage patients according to their usual practice. Each physician was requested to enroll 10 to 15 consecutive patients. In each country, the goal was to recruit approximately 25 patients per million inhabitants. Patients were followed on an annual basis for 5 years. Data were collected using standardized electronic case-report forms available in a local language. The data were centrally verified for accuracy and completeness. Five percent of centers were randomly selected for complete on-site audit.[9]

The CLARIFY registry was conducted according to the principles specified in the Declaration of Helsinki. The study was approved by the Ethics Committees and regulatory agencies according to national and local legal requirements. All participants gave a written informed consent before entering the study. CLARIFY is registered in the ISRCTN registry of clinical trials (IRSCTN43070564).

Clinical outcomes

In the current analysis, we compared management strategies and 5-year outcomes between patients recruited in Poland and in the European cohort excluding Poland. We compared the patterns of drug treatment and revascularization procedures, analyzed the efficacy of risk factor control, and assessed clinical outcomes at 5 years, including the first occurrence of cardiovascular death or nonfatal MI, cardiovascular death, nonfatal MI or nonfatal stroke, as well as all-cause and cardiovascular death and MI (fatal or nonfatal). We also assessed changes in the prevalence of angina at baseline and at 5-year follow-up in both groups.

Statistical analysis

Statistical analysis of data was performed by an independent statistics center (Robertson Centre for Biostatistics, University of Glasgow, United Kingdom). Continuous variables were presented as mean (SD) or median and interquartile range, depending on data distribution. Categorical data were presented as number and percentage. Clinical outcomes were analyzed with unadjusted Cox proportional hazards regression models in the R software, version 3.4.1 (The R Project for Statistical Computing).[10,11] Ancillary analyses were performed locally by an investigator not involved in the study, using the summary independent *t* test for continuous data, and the χ^2 test for categorical data.

RESULTS

Patient characteristics

Among the total of 32 703 patients, exactly 1000 were enrolled in Poland, and 17 326 in 23 European countries included in the study. The list of participating European countries and respective number of patients recruited are presented in Supplementary material, *Table S1*. Baseline patient characteristics are given in TABLE 1. Polish patients were younger, with a higher proportion of women, current or former smokers, and patients with a history of MI, dyslipidemia, and hypertension. At baseline, a similar proportion of patients in both cohorts had Canadian Cardiovascular Society (CCS) class II to IV angina (Polish patients, 20.3% vs patients from other European countries, 20.7%).

Medical therapy

Medical therapies used at baseline and at the end of study are shown in TABLE 2. In general, most patients in both cohorts received guideline-recommended medical treatment throughout the study.[12] Over 90% of patients received antiplatelet treatment with either aspirin or other agent (mostly clopidogrel). Similarly, over 90% of patients received a lipid-lowering drug (predominantly a statin). Angiotensin-converting enzyme inhibitors (ACEIs) and β-blockers were more frequently used in the Polish cohort, while the use of angiotensin receptor blockers and ivabradine was more frequent in the European cohort.

In patients with different risk factors at baseline, target values for blood pressure were achieved in similar, small number of patients (Polish cohort, 64.4% vs European cohort, 65% of hypertensive patients with blood pressure <140/90 mm Hg at 5 years; $P = 0.83$), similarly to lipid control (Polish cohort, 18.4% vs European cohort, 19% of patients with dyslipidemia and low-density lipoprotein [LDL] cholesterol levels

TABLE 1 Baseline patient characteristics

Parameter		Poland (n = 1000)	Other European countries (n = 17 326)	*P* value
Age, y, mean (SD)		62.1 (9.0)	64.4 (10.4)	<0.001
Male sex, n (%)		729 (72.9)	13 628 (78.7)	<0.001
Systolic BP, mm Hg, mean (SD)		132.7 (15.4)	132.3 (16.3)	0.45
Diastolic BP, mm Hg, mean (SD)		79.6 (9.5)	78.4 (9.7)	<0.001
HR by palpation, bpm, mean (SD)		69.3 (9.4)	67.2 (10.5)	<0.001
Weight, kg, mean (SD)		83.2 (13.7)	82.0 (14.1)	0.009
BMI, kg/m^2, mean (SD)		28.8 (4.3)	28.3 (4.2)	<0.001
Medical history, n (%)				
Previous MI		668 (66.8)	10 601 (61.2)	<0.001
Previous PCI		606 (60.6)	10 056 (58.0)	<0.001
Previous CABG		258 (25.8)	4 339 (25.0)	0.60
Previous stroke		32 (3.2)	675 (3.9)	0.31
Previous HF hospitalization		43 (4.3)	897 (5.2)	0.24
Asthma or COPD		58 (5.8)	1 410 (8.1)	0.01
PAD		109 (10.9)	2 238 (12.9)	0.07
Risk factors, n (%)				
Dyslipidemia		845 (85.4)	13 910 (80.3)	<0.001
Treated hypertension		789 (78.9)	12 702 (73.3)	<0.001
Diabetes		279 (27.9)	4 530 (26.2)	0.22
Smoking status	Current	132 (13.2)	2 183 (12.6)	<0.001
	Former	559 (55.9)	8 228 (47.5)	
	Never	309 (30.9)	6 914 (39.9)	
Provision of care, n (%)				
Cardiologist		627 (62.7)	16 207 (93.8)	<0.001
Noncardiologist		373 (37.3)	1070 (6.2)	

Abbreviations: BMI, body mass index; BP, blood pressure; CABG, coronary artery bypass grafting; COPD, chronic obstructive pulmonary disease; HF, heart failure; HR, heart rate; MI, myocardial infarction; PAD, peripheral artery disease; PCI, percutaneous coronary intervention

TABLE 2 Medical therapy at baseline and at the end of study (5 years)

Drug class	Baseline		At 5 years[a]	
	Poland (n = 1000)	Other European countries (n = 17 326)	Poland (n = 866)	Other European countries (n = 11 374)
Aspirin	952 (95.2)	14 878 (85.9)	766 (88.5)	8489 (80.2)
Other antiplatelet drug	197 (19.7)	5 850 (33.8)	157 (18.1)	2616 (24.7)
Dual antiplatelet therapy	168 (16.8)	4 158 (24.0)	129 (14.9)	1760 (16.6)
Lipid-lowering drugs	958 (95.8)	16 008 (92.4)	815 (94.1)	9537 (90.0)
Statins[b]	883 (92.2)	14 314 (89.4)	731 (89.7)	8373 (87.8)
β-Blockers	903 (90.3)	13 508 (78.0)	764 (88.2)	8006 (75.6)
Calcium antagonists	268 (26.8)	4 547 (26.3)	262 (30.3)	2970 (28.0)
Ivabradine	41 (4.1)	2836 (16.4)	70 (8.1)	2641 (24.9)
ACEIs	752 (75.2)	9 619 (55.5)	611 (70.6)	5600 (52.9)
ARBs	175 (17.5)	4 374 (25.3)	169 (19.5)	2860 (27.0)

Data are presented as number (percentage) of patients.

a Percentages provided for patients with no missing data

b Percentage of patients receiving lipid-lowering drugs

Abbreviations: ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker

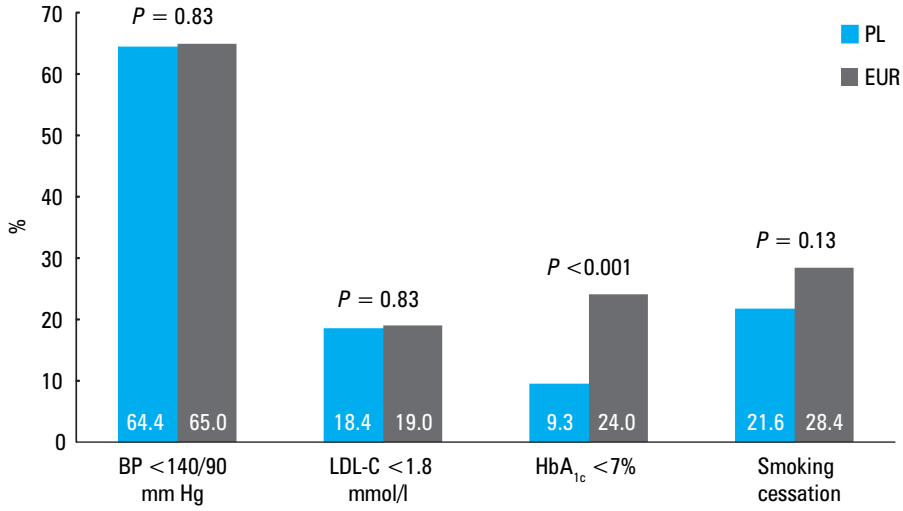

FIGURE 1 Risk factor control at 5-year follow-up. Targets achieved in patients with respective risk factors at baseline. Abbreviations: EUR, other European countries; HbA_{1c}, glycated hemoglobin A_{1c}; LDL-C, low-density lipoprotein cholesterol; PL, Poland; others, see TABLES 1 and 3

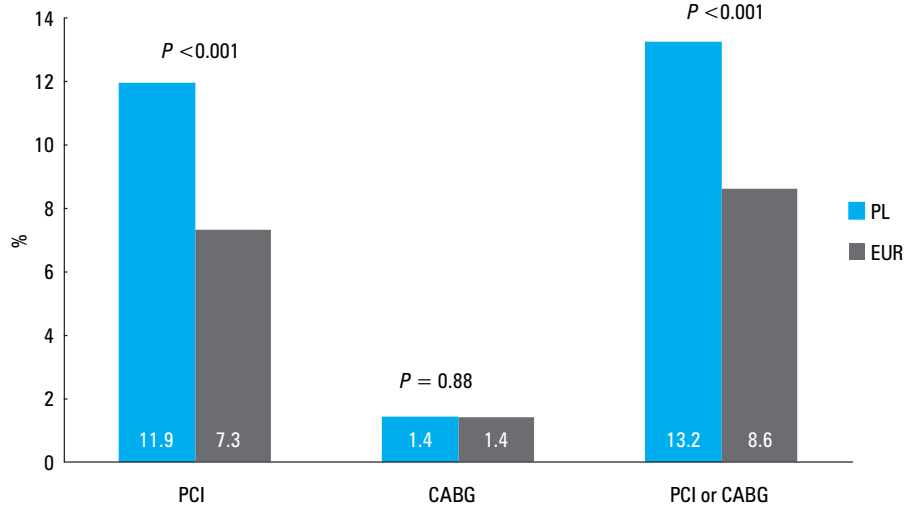

FIGURE 2 Revascularization procedures during follow-up
Abbreviations: see TABLE 1, TABLE 2, and FIGURE 1

TABLE 3 Clinical outcomes

Outcome	Events (PL compared with EUR; %)	HR (95% CI)	*P* value
CV death or nonfatal MI	8.8 vs 7.2	1.12 (0.90–1.39)	0.3
CV death, nonfatal MI, or nonfatal stroke	10.5 vs 8.6	1.12 (0.92–1.37)	0.26
All-cause death[a]	8.5 vs 7.9	0.97 (0.78–1.21)	0.81
CV death[a]	5.3 vs 4.9	0.97 (0.73–1.28)	0.82
Non-CV death[a]	3.2 vs 2.9	0.98 (0.69–1.40)	0.92
MI (fatal or nonfatal)	5.0 vs 3.1	1.51 (1.13–2.01)	0.006
Stroke (fatal or nonfatal)	2.7 vs 2.2	1.14 (0.77–1.69)	0.5

a For all death outcomes, the HR values are <1 despite higher proportion of patients experiencing the events in the Polish cohort than in the European cohort. This is due to the fact that the percent of events is only comparable between country groupings if the average follow-up time is the same. There were more dropouts in other European countries than in Poland, and therefore the time of event accrual was shorter in the former than in the latter.

Abbreviations: CV, cardiovascular; HR, hazard ratio; others, see TABLE 1 and FIGURE 1

<1.8 mmol/l [<70 mg/dl] at 5 years; *P* = 0.83). Diabetes control (glycated hemoglobin A_{1c} <7%) was worse in the Polish cohort (9.3% vs 20.4% in the European cohort; *P* <0.001). The success rate for smoking cessation was also worse in Poland than in other European countries (21.6% vs 28.4%, respectively; *P* = 0.13) (FIGURE 1).

Revascularization Incident revascularization rates are shown in FIGURE 2. Revascularization was more frequent in the Polish cohort than in the European cohort (13.2% vs 8.6%, respectively; *P* <0.001). The difference in myocardial revascularization rates resulted from a more frequent use of PCI in the Polish cohort (11.9% vs 7.3%,

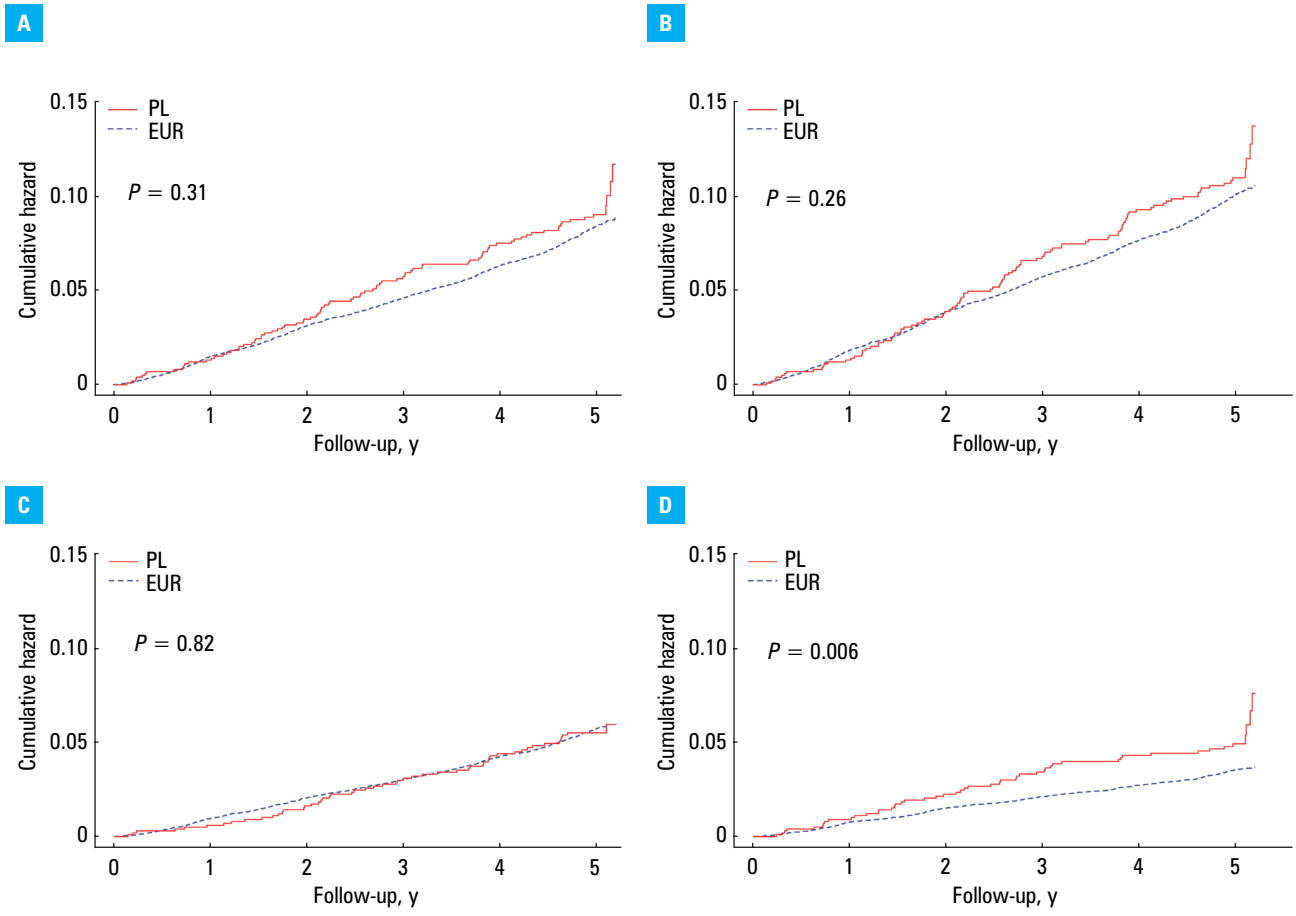

FIGURE 3 Comparison of clinical outcomes between the Polish and other European patients. Kaplan–Meier plots show the cumulative hazard for: **A** – cardiovascular death or nonfatal myocardial infarction; **B** – cardiovascular death, nonfatal myocardial infarction, or nonfatal stroke; **C** – cardiovascular death; **D** – myocardial infarction (fatal or nonfatal). Abbreviations: see **FIGURE 1**

respectively; P <0.001), while the use of coronary artery bypass surgery was equally low in both groups (1.4% vs 1.4%, respectively; P = 0.88).

Clinical outcomes Clinical outcomes are presented in **TABLE 3** and **FIGURE 3**. There was no difference in the combined double endpoint including cardiovascular death and nonfatal MI between patients from Poland and from other European countries (8.8% vs 7.2%, respectively; P = 0.31), as well as in the triple endpoint including cardiovascular death, nonfatal MI, and nonfatal stroke (10.5% vs 8.6%, respectively; P = 0.26). All-cause, cardiovascular, and noncardiovascular mortality, as well as stroke rate, did not differ between groups. However, the incidence of MI was higher in the Polish cohort (5% vs 3.1%, respectively; P = 0.006). At the end of follow-up, Polish patients had better angina control than patients from other European countries (11.5% vs 15.8% of patients with CCS class II to IV angina, respectively; P <0.001) (**FIGURE 4**).

DISCUSSION We compared the treatment patterns and 5-year outcomes in patients with SCAD enrolled in the contemporary CLARIFY registry from Poland and other European countries. We found that despite the wide use of antihypertensive drugs in both groups, only two-thirds of patients with hypertension achieved target blood pressure values recommended by the guidelines.[13] Lipid control in both cohorts was poor, with less than 20% of patients with dyslipidemia reaching the conventional target of LDL cholesterol concentration values below 1.8 mmol/l (70 mg/dl). Diabetes control was also inadequate, and significantly worse in Poland than in other European countries. Among patients who smoked at baseline, only about one-fourth stopped smoking during the follow-up. Myocardial revascularization was more common in Polish patients due to a more extensive use of PCI during the study, reflecting a good access to invasive treatment in Poland.[14] All outcomes, including all-cause and cardiovascular death, stroke, and a combination of cardiovascular death and MI, as well as cardiovascular death, MI, and stroke, did not differ between the groups, except for a higher incidence of MI in Polish patients. At the end of the 5-year follow-up, the prevalence of CCS class II–IV angina was significantly lower in the Polish cohort than in the European one.

Medical therapy Patients in both groups received medical therapy according to the European Society of Cardiology (ESC) guidelines[12] throughout

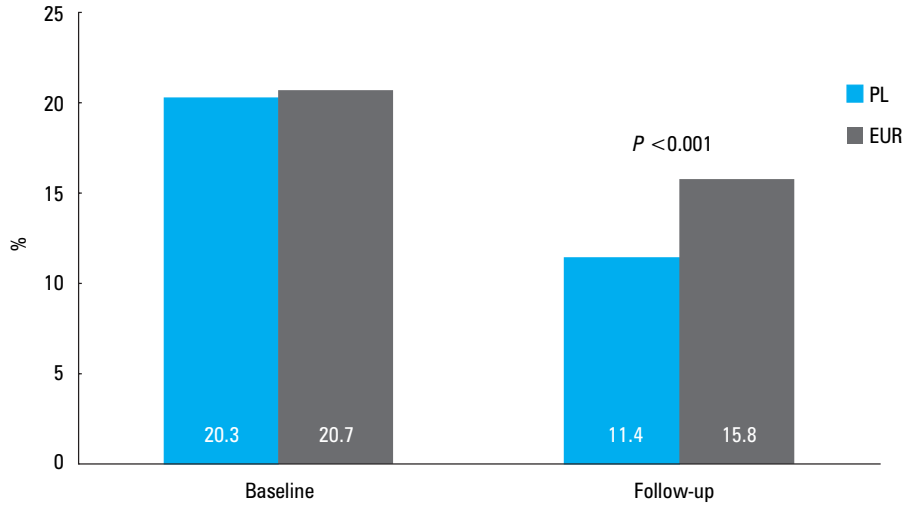

FIGURE 4 Angina Canadian Cardiovascular Society class II–IV at baseline and at 5-year follow-up
Abbreviations: see **TABLE 3** and **FIGURE 1**

the study. The proportion of patients on antiplatelet treatment was very high at baseline, with more aspirin, but less $P2Y_{12}$ inhibitors in Polish patients, and a similar proportion of dual therapy. Lipid-lowering treatment was also administered in over 90% of patients, with the predominant use of statins. The lower use of ACEIs in the European cohort was compensated by the more frequent use of angiotensin receptor blockers. At the end of the study, these proportions became somewhat lower, similarly to the findings from the ESC CAD pilot registry.[15] The use of statins and antiplatelet agents in our patients was much higher than in the studies conducted at the beginning of the 21st century,[16,17] and similar to that in more recent studies.[18-20] Of note, the more frequent use of β-blockers in the Polish cohort than in the European one in our study might have partly contributed to better angina control.

Treatment-to-target approach The 2013 ESC guidelines on the management of SCAD[12] and the 2016 European Guidelines on cardiovascular prevention in clinical practice[21] set out clear-cut targets for several risk factors in patients with SCAD. Although the use of guideline-recommended medication in our study was satisfactory, and similar to or better than in other studies,[16-20] a large majority of patients did not reach the targets.

Our results are generally similar to those observed in the recent EUROASPIRE IV survey (European Action on Secondary Prevention through Intervention to Reduce Events), conducted in 24 European countries.[22] At the 6-month follow-up in the hospital arm of EUROASPIRE IV including patients with CAD, over 40% of patients did not meet the criteria for adequate blood pressure control, about 20% achieved the target LDL cholesterol concentration of less than 1.8 mmol/l (70 mg/dl), and around a half of those with diabetes had glycated hemoglobin A_{1c} values below 7%. In our study, blood pressure control was somewhat better (although still suboptimal), LDL cholesterol control was similar, and diabetes control was much worse than in EUROASPIRE IV. In both studies, the proportion of current smokers was low (13%–16%). In our study, only one-fourth of patients quit smoking, as compared with over 50% in EUROASPIRE IV.[23] Since there is a wide variation in cessation rates between countries, these results should be interpreted with caution.[24] In general, our results reveal the need to direct careful attention not only to using evidence-based therapy but also to achieving targets specified in the guidelines, especially in ambulatory patients with SCAD.

A systematic review and meta-analysis of contemporary trials of cardiovascular prevention and rehabilitation[25] showed that participation in comprehensive programs can improve the treatment to target of multiple risk factors, and thereby reduce the rates of all-cause and cardiovascular mortality, MI, and stroke. In order to improve prognosis, patients with SCAD should be encouraged to join such programs.

Clinical outcome Over the past 2 decades, it has become more difficult to manage patients with SCAD because of increased complexity of their medical problems.[7] At the same time, the use of guideline-based therapy has considerably increased,[7] resulting in better clinical outcomes.[26]

Still, in patients with SCAD included in the recent ESC Pilot Registry,[15] both all-cause and cardiovascular death rates were high (3.4% and 3% at 6 months, respectively). It is difficult to compare the outcomes between different studies due to differences in inclusion criteria and duration of follow-up, but assuming that the incidence of cardiovascular events in time is close to linear, our patients appeared to have better prognosis (all-cause death rate at 5 years, 7.9%; cardiovascular death rate at 5 years, 5 %) than those in the ESC Pilot[15] and the REACH (Reduction of Atherothrombosis for Continued Health) registries,[27] and similar to those in the CORONOR (Cohort of Norway) study[18] and the SIGNIFY trial (Study Assessing the Morbidity–Mortality Benefits of the I_f Inhibitor Ivabradine in Patients with Coronary Artery Disease).[20]

Importantly, in the present study, there was no difference in clinical outcomes between

the groups, except for a higher rate of MI in the Polish cohort, which, to some extent, might have driven a higher rate of PCI. Nevertheless, the more frequent use of PCI in Poland cannot be solely due to a higher MI incidence. Regardless, in our study, PCI had no impact on prognosis, which is compatible with the findings from the COURAGE trial (Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation).[28]

We have previously shown that patients managed by cardiologists might have lower rates of cardiovascular outcomes than those managed by noncardiologists.[5] In the current analysis, almost all patients from other European countries were managed by cardiologists, while about one-third of the Polish cohort were cared for by noncardiologists, with no impact on the composite outcomes and cardiovascular death. This further confirms our previous hypothesis that there is no clear evidence that cardiologists provide superior guideline-based treatment, but the differences in outcome are most likely due to unquantifiable differences in patient characteristics.[5]

Angina In the entire CLARIFY population, only a minority of patients with SCAD had angina symptoms.[4] However, if present, angina with or without ischemia on noninvasive testing appeared to be associated with an increased risk of adverse cardiovascular outcomes.[4] It is unclear whether alleviation of angina can result in improved mortality and morbidity, but it can definitely improve the quality of life.[29] In our study, the more extensive use of β-blockers and PCI in the Polish cohort was associated with significantly better control of angina. This finding should be interpreted with caution, since we have no data on the indication for PCI (acute vs planned), and in addition, unidentified confounding factors cannot be excluded.

Study limitations Our study has several important limitations. Since CLARIFY data came from an observational database, it was impossible to rule out selection bias and confounders. In addition, there was no central adjudication of events, although definitions of the events were provided in the case-report forms. Direct monitoring involved only 5% of sites, while all the data were reviewed and queried remotely. Finally, the patients were recruited in 2009 and 2010, and followed up to 2015. Thus, our data may not strictly reflect current management strategies. Still, we think that our results provide important information on the treatment patterns and outcomes in patients with SCAD in Poland and other European countries.

Conclusions Risk factor control was insufficient in both patients from Poland and other European countries. The more aggressive use of revascularization in Polish patients during the follow-up was not linked to improved outcome, but, together with the more extensive prescription of β-blockers, it might have contributed to better angina control.

SUPPLEMENTARY MATERIAL

Supplementary material is available at www.mp.pl/paim.

ARTICLE INFORMATION

ACKNOWLEDGMENTS The CLARIFY registry was designed and conducted by investigators and funded by grants from Servier.

CONTRIBUTION STATEMENT ZP, MT, PGS, and JS conceived the concept of the study. IF and RY performed main statistical analyses. TR performed additional statistical analyses. ZP wrote the paper. PGS, MT, JS, IF, TR, RY, and MM provided a critical review of the manuscript. All authors contributed to this work and approved the manuscript for submission.

CONFLICT OF INTEREST ZP received consultation fees related to the CLARIFY registry. IF received research grants and honoraria from Servier and Amgen. MT received honoraria and consultation fees from Servier, Bayer, Cadila Pharmaceuticals, Janssen-Cilag, Kowa, and PERFUSE Group. PGS received research grant from Bayer, Merck, Sanofi, and Servier, as well as speaking and consulting fees from Amarin, Amgen, AstraZeneca, Bayer/Janssen, Boehringer-Ingelheim, Bristol-Myers-Squibb, Novartis, Novo-Nordisk, Pfizer, Regeneron, Sanofi, and Servier. JS has received research grants and honoraria from Astra Zeneca, Novartis, Sanofi, Servier. RY, MM, and TR report no conflicts of interest.

HOW TO CITE Parma Z, Young R, Roleder T, et al. Management strategies and 5-year outcomes in Polish patients with stable coronary artery disease in the CLARIFY registry versus other European countries. Pol Arch Intern Med. 2019; 129: 327-333. doi:10.20452/pamw.14789

REFERENCES

1 Lopez AD, Mathers CD, Ezzati M, et al. Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. Lancet. 2006; 367: 1747-1757.

2 Ford I, Robertson M, Greenlaw N, et al. CLARIFY - a simple risk model to predict cardiovascular death or myocardial infarction in patients with stable coronary artery disease. Presented at the ESC Congress 2018. August 25-29, 2018; Munich, Germany. https://esc365.escardio.org. Accessed September 2, 2018.

3 Kalra PR, Garcia-Moll X, Zamorano J, et al. Impact of chronic kidney disease on use of evidence-based therapy in stable coronary artery disease: a prospective analysis of 22 272 patients. PLoS One. 2014; 9: e102 335.

4 Steg PG, Greenlaw N, Tendera M, et al. Prevalence of angina symptoms and myocardial ischemia and their effect on clinical outcomes in outpatients with stable coronary artery disease: data from the international observational CLARIFY registry. JAMA Intern Med. 2014; 174: 1651-1659.

5 Parma Z, Steg PG, Greenlaw N, et al. Differences in outcomes in patients with stable coronary artery disease managed by cardiologists versus noncardiologists. Pol Arch Intern Med. 2017; 127: 107-114.

6 Ferrari R, Ford I, Greenlaw N, et al. Geographical variations in the prevalence and management of cardiovascular risk factors in outpatients with CAD: Data from the contemporary CLARIFY registry. Eur J Prev Cardiol. 2015; 22: 1056-1065.

7 Tendera M. Clinical profile of contemporary patients with stable coronary artery disease. Medicographia. 2017; 39: 5-10.

8 Steg PG. Heart rate management in coronary artery disease: the CLARIFY registry. Eur Heart J Suppl. 2009; 11 (suppl D): D13-D18.

9 Sorbets E, Greenlaw N, Ferrari R, et al. Rationale, design, and baseline characteristics of the CLARIFY registry of outpatients with stable coronary artery disease. Clin Cardiol. 2017; 40: 797-806.

10 R Core Team. A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria, 2017. https://www.R-project.otg/.

11 Therneau TM, Grambsch PM. Modeling survival data: extending the Cox model. Springer, New York; 2000.

12 Montalescot G, Sechtem U, Achenbach S, et al. 2013 ESC guidelines on the management of stable coronary artery disease. Eur Heart J. 2013; 34: 2949-3003.

13 Williams B, Mancia G, Spiering W, et al. 2018 ESC/ESH Guidelines for the management of arterial hypertension. Eur Heart J. 2018; 39: 3021-3104.

14 Kleczyński P, Siudak Z, Dziewierz A, et al. The network of invasive cardiology facilities in Poland in 2016 (data from the ORPKI National Registry). Kardiol Pol. 2018; 77: 805-807.

15 Komajda M, Kerneis M, Tavazzi L, et al. The chronic ischaemic cardiovascular disease ESC Pilot Registry: results of the six-month follow-up. Eur J Prev Cardiol. 2018; 25: 377-387.

16 Bhatt DL, Eagle KA, Ohman EM, et al. Comparative determinants of 4-year cardiovascular event rates in stable outpatients at risk of or with atherosclerosis. JAMA. 2010; 304: 1350-1357.

17 Daly CA, Clemens F, Lopez-Sendon JL, et al. The clinical characteristics and investigations planned in patients with stable angina presenting to cardiologists in Europe: from the Euro Heart Survey on stable angina. Eur Heart J. 2005; 26: 996-1010.

18 Bauters C, Deneve M, Tricot O, et al. Prognosis of patients with stable coronary artery disease (from the CORONOR study). Am J Cardiol. 2014; 113: 1142-1145.

19 Komajda M, Weldinger F, Kerneis M, et al. EURObservational Research Programme. The chronic ischaemic cardiovascular disease registry: pilot phase (CICD-PILOT). Eur Heart J. 2016; 37: 152-160.

20 Fox K, Ford I, Steg PG, et al. Ivabradine in stable coronary disease without clinical heart failure. N Engl J Med. 2014; 371: 1091-1099.

21 Piepoli MF, Hoes AW, Agewall S, et al. 2016 European Guidelines on cardiovascular prevention in clinical practice. Eur Heart J. 2016; 37: 2315-2381.

22 Kotseva K, Wood D, De Bacquer D, et al. EUROASPIRE IV: a European Society of Cardiology survey on the lifestyle, risk factor and therapeutic management of coronary patients from twenty four European countries. Eur J Prev Cardiol. 2016; 23: 636-648.

23 Kotseva K. The EUROASPIRE surveys; lessons learned in cardiovascular disease prevention. Cardiovasc Diagn Ther. 2017; 7: 633-639.

24 Snaterse M, Deckers JW, Lenzen MJ, et al. Smoking cessation in European patients with coronary heart disease. Results from the EUROASPIRE IV survey: a registry from the European Society of Cardiology. Int J Cardiol. 2018; 258: 1-6.

25 van Halewijn G, Deckers J, Tay HY, et al. Lessons from contemporary trials of cardiovascular prevention and rehabilitation: a systematic review and meta-analysis. Int J Cardiol. 2017; 232: 294-303.

26 Gąsior M, Pres D, Wojakowski W, et al. Causes of hospitalization and prognosis in patients with cardiovascular diseases. Secular trends in the years 2006-2014 according to the SILesian CARDiovascular (SILCARD) database. Pol Arch Intern Med. 2016; 126: 754-762.

27 Steg PG, Bhatt DL, Wilson PW, et al. One-year cardiovascular event rates in outpatients with atherothrombosis. JAMA. 2007; 297: 1197-1206.

28 Boden WE, O'Rourke RA, Teo KK, et al. Optimal medical therapy with or without PCI for stable coronary disease. N Engl J Med. 2007; 356: 1503-1516.

29 Rumsfeld JS, Alexander KP, Goff DC Jr, et al. Cardiovascular health. The importance of measuring patient-reported health status: a scientific statement from the American Heart Association. Circulation. 2013; 127: 2233-2249.