

Medical emergency team interventions in patients with ST-segment elevation myocardial infarction in Poland in 2018

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KEY WORDS

cardiovascular diseases, DAPT, ECG transmission, National Emergency Medical Services Management Support System, STEMI

EDITORIAL

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ABSTRACT

BACKGROUND The National Emergency Medical Services Management Support System, a unique information and communication technology system, was developed to reduce the burden of ST-segment elevation myocardial infarction (STEMI) in Poland. According to the European Society of Cardiology guidelines, medical emergency teams (METs) should diagnose STEMI using electrocardiogram (ECG) transmission and apply dual antiplatelet therapy (DAPT) as a pivotal treatment.

AIMS This study aimed to analyze MET interventions in patients with STEMI and assess regional differences in the management in Poland.

METHODS Using ambulance call reports, we retrospectively analyzed MET interventions due to conditions classified as I21 (acute myocardial infarction; according to the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*), which were performed in Poland between January 1, 2018 and December 31, 2018.

RESULTS In 2018, METs conducted 16 807 interventions classified as I21, which accounted for 0.5% of all MET interventions in Poland in that year. Most interventions were conducted in the Mazovia Province (13.4%; $P < 0.001$), and the lowest number was reported in the Podlasie Province (2.5%). A 12-lead ECG was performed during 98.6% of interventions, and ECG transmission in 37.49%: most often in the Mazovia Province (59.62%; $P < 0.001$), and least often in the Lublin Province (13.8%). In 72.12% of interventions, DAPT was applied: clopidogrel was the P2Y12 inhibitor used in 49.68% of interventions, and ticagrelor in 25.14% ($P < 0.001$). A P2Y12 inhibitor was most often used in the Wielkopolska Province (98.4%), and least often in the Silesia Province (40.34%).

CONCLUSIONS Significant differences in the implementation of the European Society of Cardiology guidelines regarding ECG transmission and DAPT were observed between particular provinces in Poland.

INTRODUCTION Cardiovascular diseases (CVDs) are the current leading cause of mortality globally. Every year, 17.9 million people

die of CVD, including 3.9 million in Europe, which accounts for 31% of all deaths worldwide¹ and 45% in Europe.² Although CVD-related

WHAT'S NEW?

No exact numbers regarding medical emergency team (MET) interventions in patients with ST-segment elevation myocardial infarction in Poland can be found in the literature. Such data would allow us to assess the quality of MET interventions and check whether they conform with the European Society of Cardiology guidelines (eg, those on electrocardiogram transmission or dual antiplatelet therapy). In our study, we analyzed MET interventions not only in the whole country but also in particular provinces and observed large regional differences. We showed that further measures should be developed to improve the quality of MET interventions. Of note, this is the first analysis of such data from the whole country, collected during a 1-year period using the National Emergency Medical Services Management Support System.

mortality has decreased in Europe in the last 25 years, the incidence of CVD has increased: in 2015, about 11.3 million new cases of CVD were diagnosed, constituting more than 85 million people living with CVD in general.² The overall costs of CVD in Europe are estimated at 210 billion EUR per year, including 111 billion EUR (53%) spent for healthcare, 54 billion EUR (26%) lost due to productivity losses, and 45 billion EUR (21%) spent for the private care of people with CVD.² In 2015, 41.5% of the United States population (more than 100 million people) had CVD. In 2035, this number is projected to rise to 131.2 million individuals (45.1% of the United States population), and CVD-related costs are expected to increase from 555 billion USD to 1.1 trillion USD.³

To reduce mortality and costs associated with CVD in Poland, numerous initiatives have been undertaken, such as the implementation of the National Emergency Medical Services Management Support System (NEMS MSS).⁴ It is a uniform information and communication technology system and a key milestone toward improved management, cooperation, and coordination of Emergency Medical Services (EMS) in Poland.⁴ The system integrates all data from medical documentation provided by prehospital systems (ie, dispatch and ambulance call reports). It involves a dispatcher emergency notification center, emergency care hospital departments, helicopter emergency medical services, and medical emergency teams (METs): basic METs (type P) with a nurse and/or a paramedic, as well as specialized METs (type S), additionally supported by a physician. There are 1543 METs in Poland: 75.5% of type P and 24.5% of type S.⁴ Primarily, NEMS MSS aims to meet goals defined in the Act on the National Medical Emergency System.⁴ The system enables handling emergency calls (from the phone numbers 112 and 999), managing METs, recording medical events, and localizing particular medical events and METs on a map.⁴ An emergency dispatcher determines the priority of a MET dispatch based on performed data analysis and assigns it a code: code 1 (K1), which corresponds

with a necessary, immediate MET intervention in the shortest time to reach patients' location, or code 2 (K2), which stands for a necessary intervention of an available MET. A majority of emergency calls concern patients with signs and symptoms of CVD, such as heart palpitations, arterial hypertension, and chest pain, which may be associated with acute coronary syndromes (ACSs).⁵ Therefore, NEMS MSS plays a key role in the early management of patients with ACSs, as METs not only provide a mode of transportation to hospitals but also enhance early diagnosis and treatment.^{6,7}

ST-segment elevation myocardial infarction (STEMI) is an ACS, in which fast medical intervention is important for optimal diagnosis and treatment.⁸ Despite the decrease in the relative incidence rate for STEMI, the condition is still responsible for the largest number of deaths in young people.⁹ In the United States, the incidence rate of STEMI decreased from 133 per 100 000 people yearly in 1999 to 50 per 100 000 people yearly in 2008.¹⁰ Gierlotka et al¹¹ showed that, in the years 2009 to 2012 in Poland, the incidence rate for STEMI was 196 per 100 000 people yearly. Including all hospitals where patients were treated, the hospital mortality until discharge was 10.5%. The lowest hospital mortality (6.3%) was reported in patients undergoing invasive treatment. Data obtained from the Polish National Consultant in Cardiology show that 23 748 cases of STEMI were recorded in Poland in 2018. Hudzik et al¹² presented data from the Polish Registry of ACS, which indicated that 8279 patients were admitted to hospital in 2018 due to STEMI, and 5.9% of them died during hospitalization. The optimization of STEMI treatment should be based on the fastest permanent restoration of patency to the coronary artery. Currently, according to the European Society of Cardiology (ESC) guidelines, prehospital care of patients with STEMI conducted by optimally trained and equipped METs should permit both early diagnosis of STEMI using electrocardiogram (ECG) transmission and treatment initiation.¹³ To effectively inhibit platelet aggregation in patients with STEMI, dual antiplatelet therapy (DAPT) is recommended, including acetylsalicylic acid (ASA) and a P2Y₁₂ inhibitor. Clopidogrel and ticagrelor are oral P2Y₁₂ inhibitors currently used in Poland. Moreover, in addition to DAPT, patients with STEMI need antithrombotic treatment and, in certain cases, analgesics administered in the prehospital period. According to the Ministry of Health's Act from April 20, 2016, paramedics can administer unfractionated heparin, ASA, and morphine in patients with STEMI, whereas the use of clopidogrel or ticagrelor is allowed only after ECG transmission and consultation with physicians.¹⁴ Polish experts in cardiology and

emergency medicine share the view advocated by the ESC and emphasize the key role of ECG transmission and DAPT in the first-line treatment of patients with STEMI.^{15,16} However, no detailed data about the number of MET interventions in Poland during which ECG transmission and DAPT were used can be found in the literature.

The aim of this study was to analyze MET interventions in patients with STEMI, performed within the NEMS MSS in Poland from January 1, 2018 to December 31, 2018. To our knowledge, this is the first analysis of such data obtained from the whole country in a 1-year period.

METHODS Using ambulance call reports, we retrospectively analyzed MET interventions in Poland in patients diagnosed with acute myocardial infarction (I21) during the 1-year period. Data were obtained from the NEMS MSS and analyzed at the request of the Polish National Consultant in Emergency Medicine, in cooperation with the Polish Ministry of Health. Neither ethics committee approval nor patient consent were required for this retrospective analysis.

Statistical analysis The statistical analysis was performed using IBM SPSS 24.0 (IBM Corp., Armonk, New York, United States) and MedCalc software (MedCalc Software, Mariakerke, Belgium). Continuous variables were presented as mean (SD), and discrete variables as number and percentage. The significance of differences between continuous variables was assessed with the *t* test or analysis of variance. Odds ratios (ORs) and 95% CIs were given for the study subgroups and total study population. A *P* value less than 0.05 was considered significant.

RESULTS General analysis of interventions due to conditions classified as I21 In 2018, more than 3.4 million MET interventions were

recorded in Poland, 11 664 of which were due to conditions classified (according to the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*) as I20 (angina pectoris), 16 807 as I21 (acute myocardial infarction), 274 as I22 (subsequent myocardial infarction), and 188 319 as R07 (pain in the throat and chest; including 25 960 patients with pain in the chest following injury). Interventions due to conditions coded as I20, I21, I22, and R07 (217 064 in total) accounted for about 7% of all interventions in the analyzed period.

Our analysis showed that interventions due to conditions classified as I21 accounted for 0.5% of all MET interventions in Poland in 2018. The clinical characteristics of the study groups are presented in TABLE 1. As shown, interventions were conducted more frequently in men than in women (63.41% vs 32.38%; data missing in 4.21% of cases). A total of 9437 interventions (56%) was reported in patients aged between 56 and 75 years, 3697 (22%) in patients over 76 years of age, 2891 (17%) in patients aged between 36 and 55 years, and 170 (1%) in patients aged between 19 and 35 years; 4 interventions were in individuals under 18 years of age, and data on patients' age were missing for 608 interventions (4%).

The highest number of interventions due to conditions coded as I21 was observed in the Mazovia Province (2249 [13.4%]), whereas the lowest number was recorded in the Podlasie Province (421 [2.5%]). For data on particular provinces, see TABLE 2. The priority dispatch code 1 was assigned to 10 025 interventions (59.65%), and the code 2 to 6782 (40.35%).

The reasons to call an ambulance were as follows: chest pain in 9877 interventions (58.77%), dyspnea in 1135 (6.75%), syncope in 740 (4.4%), and epigastric pain in 131 (0.78%); data were missing in 4924 interventions (29.3%).

Medical emergency teams performed a 12-lead ECG during 16 565 interventions (98.6%), intravenous injection during 15 301 (91%), intubation during 741 (4.4%), defibrillation during 684 (4.1%), and mechanical ventilation during 505 (3%). In 16 337 cases (97.2%), METs transported the patient to the hospital; in 363 (2.2%), helicopter emergency medical services were called to further manage the patient; and in 107 (0.6%), the intervention occurred in a different way.

Electrocardiogram transmission Medical emergency teams used ECG transmission during 6301 interventions (37.49%), cardiac pacing during 22 (0.13%), and cardioversion during 13 (0.08%). The number of ECG transmissions performed in particular provinces is presented in TABLE 3. The highest number of ECG transmissions was noted in the Mazovia (1341) and Silesia (1036) provinces, which constituted 59.62% and 48.66% of interventions due to conditions

TABLE 1 Demographic characteristics of the study patients

Variable		Interventions, n (%)
Sex	Male	10 657 (63.41)
	Female	5442 (32.38)
	No data	708 (4.21)
Age, y	0–18	4 (0.02)
	19–35	170 (1.01)
	36–55	2891 (17.2)
	56–75	9437 (56.15)
	≥76	3697 (22)
	No data	608 (3.62)

TABLE 2 Medical emergency team interventions due to conditions classified as I21 in particular provinces in Poland in 2018

Province	Population, n	I21 interventions, n (%)	OR	95% CI	P value
Podlasie	1 184 548	421 (0.035)	0.81	0.74–0.9	<0.001
Kujawy-Pomerania	2 082 944	787 (0.038)	0.86	0.8–0.93	<0.001
Lower Silesia	2 902 547	1525 (0.052)	1.2	1.14–1.27	<0.001
Łódź	2 476 315	1515 (0.061)	1.4	1.33–1.47	<0.001
Lubuskie	1 016 832	476 (0.047)	1.07	0.98–1.17	0.14
Pomerania	2 324 251	797 (0.034)	0.78	0.73–0.84	<0.001
Małopolska	3 391 380	1260 (0.037)	0.84	0.8–0.9	<0.001
Lublin	2 126 317	862 (0.04)	0.93	0.87–0.99	0.029
Warmia-Masuria	1 433 945	591 (0.041)	0.94	0.87–1.02	0.155
Opole	990 069	702 (0.07)	1.62	1.5–1.75	<0.001
Wielkopolska	3 489 210	1250 (0.035)	0.82	0.78–0.87	<0.001
Podkarpacie	2 129 138	751 (0.035)	0.81	0.75–0.87	<0.001
Silesia	4 548 180	2129 (0.047)	1.07	1.02–1.12	0.003
Świętokrzyskie	1 247 732	454 (0.036)	0.83	0.76–0.91	<0.001
Mazovia	5 384 617	2249 (0.042)	0.95	0.91–0.998	0.040
West Pomerania	1 705 533	1038 (0.061)	1.39	1.31–1.48	<0.001
In total	38 433 558	16 807 (0.044)	–	–	–

Abbreviations: I21, acute myocardial infarction according to the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*; OR, odds ratio

coded as I21 in these areas, respectively. The lowest number of ECG transmissions was observed in the Lublin Province (119), which accounted for 13.8% of interventions due to conditions coded as I21 there.

Dual antiplatelet therapy Patients were given ASA as first-line antiplatelet treatment during 15 029 interventions (89.42%), dual antiplatelet therapy was applied during 12 121 interventions (72.12%), clopidogrel during 8350 (49.68%), and ticagrelor during 4225 (25.14%). Unfractionated heparin was administered as an anticoagulant in 7825 interventions (46.56%), morphine as an analgesic in 6657 (39.61%), and nitroglycerine in 4913 (29.23%). Antiplatelet monotherapy with a P2Y12 inhibitor was most frequently applied during interventions in the Wielkopolska (1235 interventions), Mazovia (2132), and West Pomerania (965) provinces, which corresponds with 98.4%, 94.79%, and 92.96% of interventions due to conditions coded as I21 in these provinces, respectively. A P2Y12 inhibitor was least frequently applied during interventions in the Silesia (859 [40.34%]) and Opole (339 [48.29%]) provinces. The frequency of P2Y12 inhibitor use in particular provinces is presented in TABLE 4, and detailed information about the pharmacotherapy applied during interventions, in TABLE 5.

DISCUSSION The retrospective analysis of MET interventions in patients with suspected STEMI in Poland, coordinated by the NEMS MSS between January 1, 2018 and December 31, 2018, showed that: 1) ECG transmission significantly facilitates the work of METs and 2) DAPT is currently a standard approach in the first-line prehospital treatment of STEMI.

The obtained data should be compared with those derived from other sources of information on the prevalence of myocardial infarction in Poland (ie, the National Registry of Invasive Cardiology Procedures [in Polish, Ogólnopolski Rejestr Procedur Kardiologii Inwazyjnej; ORPKI] and the Polish Registry of Acute Coronary Syndromes [PL-ACS]). The ORPKI database, operated by Jagiellonian University Medical College in Kraków, collects data on all percutaneous invasive procedures in Poland. In 2016, 49 893 patients with STEMI or non-STEMI were included in the ORPKI registry, 45 311 of whom had obstructive coronary artery disease.¹⁷ The PL-ACS registry contains data from 417 institutions. The analysis of the database showed that 132 715 patients had STEMI between 2006 and 2013.¹⁸ According to the ORPKI registry, 21 993 percutaneous coronary interventions for STEMI were performed in 2017.¹⁹ The studies differ with regard to methods of data collection. A total of 16 807 interventions due to conditions coded as

TABLE 3 Electrocardiogram transmission during medical emergency team interventions due to conditions classified as I21 in particular provinces in Poland in 2018

Province	I21 interventions, n	ECG transmission, n	OR	95% CI	P value
Podlasie	421	120	0.66	0.54–0.82	<0.001
Kujawy-Pomerania	787	341	1.28	1.1–1.47	0.001
Lower Silesia	1525	526	0.88	0.79–0.98	0.021
Łódź	1515	467	0.74	0.66–0.83	<0.001
Lubuskie	476	94	0.41	0.33–0.52	<0.001
Pomerania	797	261	0.81	0.7–0.94	0.007
Małopolska	1260	393	0.76	0.67–0.86	<0.001
Lublin	862	119	0.27	0.22–0.33	<0.001
Warmia-Masuria	591	237	1.12	0.94–1.32	0.197
Opole	702	135	0.4	0.33–0.48	<0.001
Wielkopolska	1250	386	0.74	0.65–0.84	<0.001
Podkarpacie	751	208	0.64	0.54–0.75	<0.001
Silesia	2129	1036	1.58	1.44–1.73	<0.001
Świętokrzyskie	454	148	0.81	0.66–0.98	0.034
Mazovia	2249	1341	2.46	2.25–2.69	<0.001
West Pomerania	1038	490	1.87	1.64–2.12	<0.001
In total	16 807	6303	–	–	–

Abbreviations: ECG, electrocardiogram; others, see TABLE 2

TABLE 4 Use of an antiplatelet P2Y12 inhibitor during medical emergency team interventions due to conditions classified as I21 in particular provinces in Poland in 2018

Province	I21 interventions, n	Patients administered a P2Y12 inhibitor, n	OR	95% CI	P value
Podlasie	421	320	1.25	0.996–1.57	0.054
Kujawy-Pomerania	787	697	3.05	2.45–3.81	<0.001
Lower Silesia	1525	880	0.54	0.48–0.6	<0.001
Łódź	1515	1098	1.04	0.92–1.17	0.53
Lubuskie	476	413	2.58	1.98–3.38	<0.001
Pomerania	797	544	0.85	0.73–0.99	0.034
Małopolska	1260	650	0.42	0.37–0.47	<0.001
Lublin	862	644	1.16	0.995–1.36	0.057
Warmia-Masuria	591	456	1.33	1.1–1.62	0.004
Opole	702	339	0.4	0.34–0.46	<0.001
Wielkopolska	1250	1235	24.3	15.6–37.9	<0.001
Podkarpacie	751	534	0.97	0.83–1.14	0.367
Silesia	2129	859	0.27	0.24–0.29	<0.001
Świętokrzyskie	454	292	0.71	0.51–0.86	<0.001
Mazovia	2249	2132	7.18	5.95–8.68	<0.001
West Pomerania	1038	965	5.21	4.1–6.63	<0.001
In total	16 812	12 058	–	–	–

Abbreviations: see TABLE 2

TABLE 5 Pharmacological treatment applied during medical emergency team interventions due to conditions classified as I21 in particular provinces in Poland in 2018

Province	I21 interventions, n	ASA ^a	Morphine ^b	Heparin ^b	NTG ^c	Clopidogrel ^a	Ticagrelor ^a	Fentanyl ^b
Podlasie	421	337 (80)	178 (42)	286 (68)	154 (37)	145 (34)	175 (42)	5 (1)
Kujawy-Pomerania	787	706 (90)	323 (41)	559 (71)	237 (30)	343 (44)	354 (45)	11 (1)
Lower Silesia	1525	1296 (85)	448 (29)	364 (24)	479 (31)	587 (38)	293 (19)	76 (5)
Łódź	1515	1098 (72)	694 (46)	604 (40)	275 (18)	752 (50)	344 (23)	48 (3)
Lubuskie	476	364 (76)	275 (58)	99 (21)	193 (41)	291 (61)	122 (26)	4 (1)
Pomerania	797	768 (96)	349 (44)	328 (41)	218 (27)	326 (41)	273 (34)	12 (2)
Małopolska	1260	1184 (94)	527 (42)	714 (57)	378 (30)	492 (39)	158 (13)	19 (2)
Lublin	862	813 (94)	360 (42)	442 (51)	239 (28)	511 (59)	133 (15)	27 (3)
Warmia-Masuria	591	544 (92)	273 (46)	311 (53)	163 (28)	244 (41)	212 (36)	17 (3)
Opole	702	516 (74)	179 (25)	193 (27)	169 (24)	263 (37)	76 (11)	9 (1)
Wielkopolska	1250	1214 (97)	689 (55)	512 (41)	488 (39)	936 (75)	299 (24)	34 (3)
Podkarpacie	751	727 (97)	314 (42)	458 (61)	212 (28)	400 (53)	134 (18)	24 (3)
Silesia	2129	1956 (92)	591 (28)	1248 (59)	596 (28)	645 (30)	214 (10)	66 (3)
Świętokrzyskie	454	380 (84)	98 (22)	156 (34)	104 (23)	121 (27)	171 (38)	14 (3)
Mazovia	2249	2178 (97)	911 (41)	1450 (64)	711 (32)	1315 (58)	817 (36)	57 (3)
West Pomerania	1038	958 (92)	450 (43)	103 (10)	299 (29)	524 (50)	451 (43)	23 (2)
In total	16 807	15 039 (89)	6659 (40)	7827 (47)	4915 (29)	7895 (47)	4226 (25)	446 (3)

Data are presented as number (percentage) unless otherwise indicated.

- a Administered orally
- b Administered intravenously
- c Administered sublingually

Abbreviations: ASA, acetylsalicylic acid; NTG, nitroglycerine; others, see TABLE 2

I21, which we referred to in our study, is in line with the results presented in those registries.

The most frequent reason for an emergency call due to conditions subsequently coded as I21 was chest pain (58.77%). In a majority of cases, emergency calls concerned patients aged between 56 and 76 years (56%) and more often men (63.41%) than women (32.38%). Obłój et al¹⁰ conducted a retrospective analysis of MET interventions in the region of Kluczbork-Olesno in the years 2012 to 2015, which showed that interventions due to conditions classified as I21 more frequently concerned men than women and that ECG transmission considerably helped METs to manage cardiac patients. Rzońca et al²⁰ conducted a retrospective analysis of MET interventions in Lublin in 2014 and obtained similar results showing that men are more vulnerable to ACSs than women. Another retrospective analysis of MET interventions, conducted in the Rzeszowski region in 2012, showed that cardiovascular disorders were the most frequent reasons for an emergency call, and interventions most frequently concerned patients aged

over 70 years (36.96%), more often men (51.21%) than women.²¹

In our study, a majority of interventions due to conditions classified as I21 (59.65%) were assigned the dispatch priority code 1. The dispatch priority code 2 causes a significant delay in reaching patients' location by METs and, consequently, results in the delayed restoration of coronary artery patency.²² Clawson et al²³ showed that the dispatch priority code strongly influences the delay in the initiation of reperfusion therapy in patients with ACSs.

Most interventions due to conditions coded as I21 were reported in the Mazovia Province (2249 [13.4%]), and least in the Podlasie Province (421 [2.5%]). During almost every intervention due to conditions classified as I21, a 12-lead ECG (98.6%) and an intravenous injection (91%) were performed; interventions usually ended in transporting the patient to the hospital (97.2%). Medical emergency teams used ECG transmission in 37.49% of the interventions due to conditions classified as I21: most frequently in the Mazovia Province (59.62%),

and least often in the Lublin Province (13.8%). As reported in the literature, the mean percentage of performed ECG transmissions was 30% to 50%.^{24,25} Kleinrok et al²⁶ showed that 1500 of 7000 patients in whom ECG transmission was applied were diagnosed with STEMI. Rekosz et al²⁷ analyzed MET interventions in the region of Warsaw in the years 2009 to 2013 and showed that ECG transmission considerably improved the diagnostic ability of METs, which led to better treatment of patients with CVDs. Transmitting electrocardiograms from an ambulance to an invasive cardiology center is one of the strategies used by METs for the management of patients with STEMI. It shortens the time needed to consult a cardiologist and helps to decide whether the patient should be transported to the hospital.²⁸ It also decreases the transportation and reperfusion time, resulting in better clinical outcomes.^{29,30} Having the previous ECG transmission records available, METs can establish a more accurate diagnosis of sudden cardiac disorders such as STEMI.³¹

In 72.12% of interventions, DAPT was applied as the first-line antiplatelet therapy: clopidogrel was used as a P2Y₁₂ inhibitor in 49.68% of interventions, and ticagrelor in 25.14%. An antiplatelet P2Y₁₂ inhibitor was most frequently applied during interventions in the Wielkopolska (98.4%), Mazovia (94.79%), and West Pomerania (92.96%) provinces, and least often in the Silesia (40.34%) and Opole (48.29%) provinces. Our study shows that ECG transmission and DAPT therapy are successfully used in Poland, and the NEMS MSS plays a key role in the first-line treatment of STEMI, as it can either reduce or extend the diagnosis time. Of note, METs should be perceived not only as units transporting patients to the hospital but also as healthcare professionals who make an initial diagnosis and start pharmacological treatment according to obligatory guidelines.³²

To further improve the quality of MET interventions, the NEMS MSS should be continually developed, METs modernized and trained, and DAPT promoted as the optimal first-line treatment of STEMI. Polish experts in cardiology and emergency medicine unambiguously approve the use of ECG transmission and DAPT in the first-line treatment of STEMI.^{15,16} Patients with acute total occlusion of the coronary artery benefit most from immediate angiography, and ST-segment elevation is absent in about 25% of them.³³ The recently developed paradigm of the occlusion myocardial infarction rather than STEMI poses new challenges for paramedics. However, the criteria other than ST-segment elevation are not independent predictors of total artery occlusion in non-STEMI.³⁴

Limitations Our analysis was performed using ambulance call reports collected in a 1-year period. To obtain a more comprehensive view

of the MET performance, data from a longer time interval should be analyzed. We could not refer to data gathered earlier than in 2018 because they were not available. Furthermore, we assumed that patients with conditions classified by METs as I21 had STEMI. The best way to check this assumption is to compare data from the NEMS MSS with those stored in the cardiovascular data registries, which is currently impossible. However, the number of interventions due to conditions coded as I21 is similar to the number of performed percutaneous coronary interventions. Moreover, the analysis showed that METs can establish a proper diagnosis of STEMI.

Conclusions Significant differences can be observed between provinces in Poland with regard to the application of the ESC guidelines on ECG transmission and the initiation of DAPT during MET interventions in prehospital treatment of patients initially diagnosed with acute myocardial infarction. We suggest that more emphasis should be put on the postgraduate education of medical staff, which could result in better compliance with the ESC recommendations.

ARTICLE INFORMATION

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CONFLICT OF INTEREST None declared.

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