Polish Registry of Acute Coronary Syndromes (PL-ACS)
Characteristics, treatments and outcomes of patients with acute coronary syndromes in Poland

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Abstract

Background: In Poland, together with the transformation of the political system, significant positive changes have been made to the national health care system. This provided a possibility for hospitals to apply current standards of care to patients with acute coronary syndromes (ACS).

Aim: To assess contemporary data on epidemiology, management and outcomes of patients with ACS in Poland, and to evaluate adherence to the guidelines' recommended treatment.

Methods: We performed an observational study of 100,193 patients hospitalised due to unstable angina, non-ST-segment elevation myocardial infarction (NSTEMI), or ST-segment elevation myocardial infarction (STEMI), prospectively enrolled in 417 hospitals from October 2003 to March 2006 in the ongoing Polish Registry of Acute Coronary Syndromes (PL-ACS). The registry is carried out in cooperation with the Ministry of Health and the National Health Fund.

Results: The initial diagnoses were unstable angina in 42.2%, NSTEMI in 26.6%, and STEMI in 31.2% of patients. About one-third of patients were treated outside of cardiology departments (mainly in the internal medicine wards). In patients without ST elevation, invasive strategy (early coronary angiography) was used with almost equal frequency in unstable angina (29.4%) and NSTEMI (31.7%). However, in-hospital mortality was low in unstable angina (0.8%), being much higher in NSTEMI patients (6.6%), ($p < 0.001$). In STEMI reperfusion therapy was administered in 63.3% of patients (thrombolysis 7.8%, primary PCI 54.1%, and PCI after thrombolysis 1.4%). In-hospital mortality in STEMI was 9.3%. Median times from the onset of symptoms to invasive treatment were: 37 hours in unstable angina, 23 hours in NSTEMI, and 5 hours in STEMI. The guidelines' recommended pharmacotherapy was used in a high percentage of patients except for thienopyridines and GP IIb/IIIa inhibitors.

Conclusions: The Polish Registry of Acute Coronary Syndromes shows several discrepancies between guidelines' recommended treatment and their utilisation in everyday practice. Particularly, the under-utilisation of invasive treatment in patients with NSTEMI is alarming. Efforts should be made to increase the usage of invasive treatment in NSTEMI patients and to shorten the delay from the symptom onset to intervention.

Key words: acute coronary syndromes, registry, epidemiology, in-hospital outcomes, invasive strategy, guidelines' recommended treatment

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Introduction

In recent years, considerable advances have been made in the diagnosis and management of unstable angina (UA), non-ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI). However, acute coronary syndromes (ACS) continue to be a significant health problem in the industrialised world, being responsible for a substantial number of deaths due to cardiovascular diseases [1]. Several practice guidelines have been developed in Europe and the US to improve outcomes of ACS patients by implementation of the recommendations into clinical practice [2-6]. However, it is well known from surveys and registries performed so far that epidemiology and management of ACS patients differ a lot between countries and that a wide gap exists between guidelines and current clinical practice [7-10]. Additionally, many patients in several European countries are hospitalised in internal medicine wards instead of coronary care units or cardiology wards and these patients are rarely adequately represented in the registries. Finally, multinational registries do not represent any real, existing geographical population, instead they rather represent statistical averages for the participating centres. Therefore, the need still exists for national registries to collect substantial data on a population-based principle.

In Poland, together with the transformation of the political system, significant positive changes have been made to the national health care system. This provided a possibility for hospitals to apply current standards of care to ACS patients. Furthermore, once Poland became a member of the European Union, the Polish Cardiac Society recommend the ESC Guidelines to be in use in Poland [2-4]. A nationwide registry of ACS had never been conducted in Poland before. Thus, the Polish Registry of Acute Coronary Syndromes (PL-ACS) was launched in late 2003 to assess contemporary data on epidemiology, management and outcomes of ACS patients in Poland. The present study summarises the main initial findings from the PL-ACS Registry, presenting the clinical and demographic characteristics of the patients, their management, and in-hospital outcomes.

Methods

The PL-ACS Registry was a joint initiative of the Silesian Centre for Heart Diseases in Zabrze and the Ministry of Health of Poland. Logistic support was obtained from the National Health Fund, which is a nationwide, public health insurance institution in Poland and which insurance policy is required for all Polish citizens. The pilot phase of the Registry commenced in October 2003 in Silesia, Poland. In the following months, further regions were opened and from June 2005 all Polish regions collected data for the PL-ACS Registry.

Participating Centres

Out of all Polish hospitals, a total of 535 centres were selected to be invited to enter the registry, based on the following conditions: the centre (1) contains one of the following wards in its structure: coronary care unit, cardiology, cardiac surgery, internal medicine or intensive care unit, or (2) does not have any of these wards but hospitalises at least 10 ACS patients per year. The data required for this selection were obtained from the National Health Fund database. Sixty-six centres were opened at the beginning of the programme and the others entered the registry in subsequent months. Some of the centres stopped collecting data while the registry was running. Finally, the total number of centres participating in the registry was 417 (Figure 1). Among them, there were 59 (14%) centres with percutaneous coronary intervention (PCI) facilities. In 3 out of 16 regions in Poland, data were obtained from all the centres hospitalising patients with ACS. The percentage of participating centres in the other regions ranged from 43% to 94% with a median value of 78% and interquartile range of 72% to 85%.

Patients

According to the protocol, all admitted patients with suspected ACS were screened to be eligible to enter the registry but the patients were not enrolled until ACS was confirmed. Short stays for observation in the admission room before transfer to another hospital for management were not registered. The initial diagnosis was made by the attending physician, based on clinical presentation, initial electrocardiographic pattern, and markers of myocardial necrosis acquired at least 6 hours after the symptom onset. The patients were then classified as having UA, NSTEMI, or STEMI. The definition of the initial diagnosis (that affects selection of treatment strategy) was as follows:

- **STEMI:** presence of: 1) ST-segment elevation consistent with MI of ≥2 mm in adjacent chest leads and/or ST-segment elevation of ≥1 mm in 2 or more standard leads or new left bundle branch block, and 2) positive cardiac necrosis markers.
- **NSTEMI:** 1) absence of ST-segment elevation consistent with MI of ≥2 mm in adjacent chest leads and ST-segment elevation of ≥1 mm in 2 or more standard leads and new left bundle branch block, and 2) positive cardiac necrosis markers.

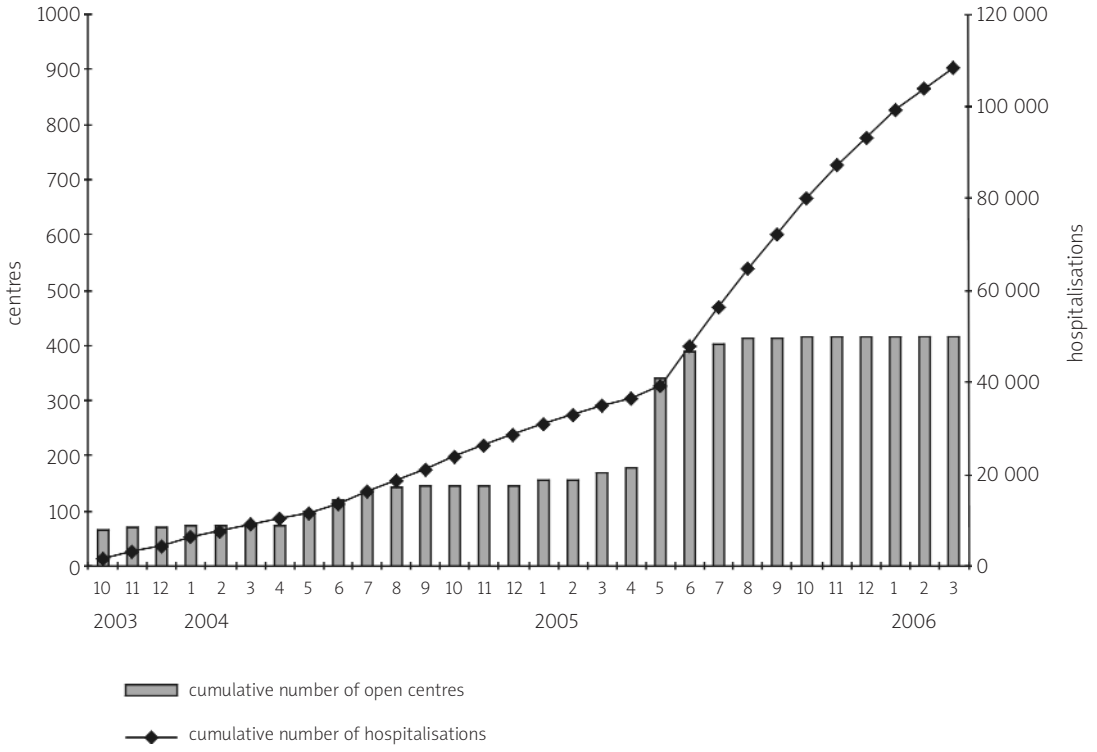

Figure 1. Cumulative numbers of enrolled patients and participating centres in successive months of running the PL-ACS Registry

- **UA:** 1) absence of ST-segment elevation consistent with MI of ≥2 mm in adjacent chest leads and ST-segment elevation of ≥1 mm in 2 or more standard leads and new left bundle branch block, and 2) negative cardiac necrosis markers, and 3) angina pectoris (or equivalent type of ischaemic discomfort) with any one of the three following features: a) angina occurring at rest and prolonged, usually greater than 20 minutes, b) new-onset angina of at least CCS class III severity, or c) recent acceleration of angina reflected by an increase in severity of at least one CCS class to at least CCS class III.

If the patient was hospitalised during the same ACS in more than one hospital (transferred patient), all hospitals were required to complete the registry data. These hospitalisations were linked together during data management and were analysed as one ACS

Protocol and definitions

A detailed protocol was prepared before the registry was started with inclusion and exclusion criteria, methods and logistics, and definitions of all fields in the registry dataset. However, it was amended twice. In May 2004, the definitions were adapted to be compatible with the Cardiology Audit and Registration Data Standards (CARDS) [11]. Nevertheless, the PL-ACS Registry case report form (CRF) covers only part of the CARDS dataset. The second amendment was distributed to the hospitals in May 2005 together with the addition of new fields to the CRF. Finally, the registry CRF included 125 fields regarding demographic, clinical, and electrocardiographic characteristics of a patient, the diagnostic and treatment modalities, and in-hospital outcomes.

In-hospital complications were defined as follows:

- **Myocardial infarction** – ischaemic event that met the ESC/ACC criteria for MI (for patients with initial diagnosis of UA) or re-infarction (for patients diagnosed initially as NSTEMI or STEMI) and was evidently clinically distinct from the index event at the time of admission [12].
- **Stroke** (haemorrhagic or ischaemic) – an acute neurologic deficit that lasted more than 24 hours and affected the ability to perform daily activities or resulted in death.
- **Major bleeding** – overt clinical bleeding that 1) was associated with a drop in haemoglobin of greater than 5 g/dl (0.5 g/l) or in haematocrit of greater than 15%

Table I. Baseline demographic and clinical characteristics of patients with ACS

	UA (n=42 232)	NSTEMI (n=26 663)	STEMI (n=31 298)
Age [years]	64.9±11.0	68.0±11.8	64.0±12.4
≥75 years [%]	21.6	33.3	22.8
≥85 years [%]	2.1	5.4	3.8
Female gender [%]	44.0	40.9	34.0
Diabetes [%]	22.1	28.1	21.2
Current smoking [%]	21.5	24.7	39.1
Hypertension [%]	76.3	71.2	58.7
Hypercholesterolemia [%]	53.1	44.7	41.1
Obesity [BMI ≥30 kg/m^2] [%]	21.4	20.0	16.8
Prior myocardial infarction [%]	30.6	28.1	15.6
Prior PCI [%]	5.8	3.2	1.4
Prior CABG [%]	11.9	7.1	4.9

Abbreviations: BMI – body mass index, CABG – coronary artery bypass grafting surgery, NSTEMI – non-ST-segment elevation myocardial infarction, PCI – percutaneous coronary intervention, STEMI – ST-segment elevation myocardial infarction, UA – unstable angina

(absolute), or 2) caused haemodynamic compromise, or 3) required blood transfusion.

Data collection

Data were collected by the skilled physicians who were in charge of an individual patient. They were entered either directly into electronic case report form or a printed CRF was used temporarily before putting data into the electronic CRF. We used dedicated software based on the Excel worksheet (Microsoft, US). Internal checks for missing or conflicting data and values markedly out of the expected range were implemented by the software. Once a month, the data automatically were encoded and sent to the National Health Fund, where they were additionally compared with standard patients' reports sent by the hospitals. After that the National Health Fund sent the data to the Silesian Centre for Heart Diseases, the data management and analysis centre, and further edit checks were applied. No site audits were required by the protocol to be carried out in the participating centres.

Statistical methods

Continuous variables are reported as means ±SD or medians and interquartile ranges, as appropriate. Categorical variables are expressed as percentages. In-hospital outcomes in different ACS categories were compared using the chi-square test. All analyses were performed according to the initial diagnosis. A two-sided p value ≤0.05 was considered significant. For all calculations, the STATISTICA 7.1 software (StatSoft, Inc., Tulsa, OK, USA) was used.

Results

From October 2003 to March 2006 a total of 108,302 completed CRFs for patients with ACS were collected from 417 centres (78% of all invited). About two-thirds of them were obtained for patients hospitalised after May 2005 due to the opening of the new centres (Figure 1). The median number of enrolled patients per hospital was 130 with interquartile range from 53 to 293. Because some patients were transferred between hospitals and had duplicated CRFs, the final number of patients with ACS was 100,193. The initial diagnoses for these patients were UA in 42.2%, NSTEMI in 26.6%, and STEMI in 31.2%.

Baseline demographic and clinical characteristics are presented in Table I. Patients diagnosed with NSTEMI were older than UA and STEMI patients. Unstable angina and STEMI patients were of similar age. Females were more frequently represented in UA (44.0%) than in NSTEMI (40.9%) and STEMI (34.0%). Patients with NSTE--ACS had higher incidence of diabetes, hypertension, hypercholesterolaemia, obesity, prior MI, and history of PCI or CABG than STEMI patients, who were more likely to be current smokers.

Haemodynamical and ECG findings on admission are shown in Table II. Cardiac arrest before admission most frequently developed in patients with STEMI (5%). Systolic and diastolic blood pressures measured on admission were the highest in UA and the lowest in STEMI patients, although heart rate was the highest in NSTEMI. Killip classes III or IV occurred with similar frequency in NSTEMI and STEMI. However, cardiogenic shock dominated in STEMI patients. Unstable angina patients had low rates of severe haemodynamic disturbances on admission. About 10-15% of patients had other than sinus rhythm in admission ECG records, with the highest incidence of atrial fibrillation in the NSTEMI group. In these patients, conduction abnormalities were also more often seen. In NSTE-ACS, ST-segment depression was the most frequently observed abnormality but ST-segment elevation was also noted in 4.5%. About 16% of UA and 7% of NSTEMI patients did not have any ST-T changes in the initial ECG records.

The wards of the first and final hospitalisation of ACS patients are presented in Table III. Both NSTE-ACS and STEMI patients were initially admitted to cardiology or

Table II. Haemodynamical and ECG findings on admission in patients with ACS

	UA	NSTEMI	STEMI
Cardiac arrest before admission [%]	0.3	2.0	5.0
Heart rate [beats/minute]*	75±15	81±19	78±18
Systolic blood pressure [mmHg]*	146±28	142±33	131±33
Diastolic blood pressure [mmHg]*	86±15	84±19	79±20
Killip class [%]			
I	92.0	77.6	79.3
II	6.6	11.6	8.7
III	0.9	7.2	3.8
IV	0.5	3.6	8.2
Localisation of STEMI [%]			
anterior	–	–	40.5
inferior	–	–	48.8
other	–	–	10.7
ECG rhythm* [%]			
sinus	91.0	85.7	90.7
atrial fibrillation	6.4	9.9	6.2
pacemaker	1.4	1.3	0.5
other	1.2	3.1	2.6
ECG conduction abnormalities* [%]			
normal	81.3	78.0	85.5
LBBB	5.1	7.1	2.5
RBBB	4.2	4.8	3.5
other	9.4	10.1	8.6
ECG ST-T changes [most severe]* [%]			
normal	15.9	7.3	0.5
ST elevation	4.5	4.5	94.0
ST depression	33.3	46.6	1.6
pathological T inversion	18.2	20.1	1.9
other	28.1	21.5	2.0

Abbreviations: see Table I
Continues variables are presented as mean ± SD
** Information available since June 2005 for 64 486 (64.6% of all) patients*

coronary care units in 60-70% of cases (in Poland, the coronary care unit in most cases is a part of the cardiology ward) whilst about one-third of the patients were hospitalised in internal medicine wards. Some patients were then transferred to cardiology wards (mainly for invasive treatment). Finally, in the hospitals with PCI facilities there were hospitalised 35% of UA, 39% of NSTEMI and 64% of STEMI patients. A small minority of patients (2-5%) were treated in intensive care units or other wards. Median duration of hospitalisation was 6 days in UA (with interquartile range of 4-8 days), 8 days (4-11) in NSTEMI, and 6 days (4-9) in STEMI patients.

Table III. First and final hospitalisation wards of patients with ACS

	UA [%]	NSTEMI [%]	STEMI [%]
First ward			
cardiology/CCU	60.7	62.8	70.5
with PCI facility	*30.4*	*31.8*	*51.3*
internal medicine	37.3	34.7	23.3
intensive care unit	0.4	1.3	1.6
other	1.6	1.2	4.6
Final ward			
cardiology/CCU	63.2	67.2	77.6
with PCI facility	*35.0*	*39.3*	*63.7*
internal medicine	34.7	30.3	17.6
intensive care unit	0.4	1.2	1.6
other	1.7	1.3	3.2

Abbreviations: CCU – coronary care unit, others – see Table I

Table IV. In-hospital treatment of patients with ACS

	UA [%]	NSTEMI [%]	STEMI [%]
Thrombolysis alone	0.3	0.6	7.8
GP IIb/IIIa inhibitor	0.9	3.1	15.9
without invasive strategy	0.2	0.6	1.3
with invasive strategy	2.7	8.4	25.9
Coronary angiography	29.4	31.7	59.2
PCI for treatment of culprit lesion(s)	17.4	23.1	55.5
PCI after thrombolysis	0.6	0.7	2.6
PCI without preceding thrombolysis	99.4	99.3	97.4
bare metal stent	79.8	83.3	89.8
drug eluting stent	5.7	3.1	0.9
elective GP IIb/IIIa inhibitor	2.1	5.5	13.1
bailout GP IIb/IIIa inhibitor	1.6	4.3	11.8
final TIMI flow grade 3	95.9	91.8	90.6
Additional PCI for other significant stenosis	2.7	3.6	5.0
IABP	0.1	0.4	1.1
CABG (during hospitalisation)	1.3	0.9	0.6
CABG (deferred)	5.2	4.7	3.9

Abbreviations: IABP – intra-aortic balloon pump, TIMI – thrombolysis in myocardial infarction, others – see Table I

In-hospital management practices

Treatment practices during hospitalisation for ACS are presented in Table IV. In the NSTE-ACS group, invasive strategy (coronary angiography) was applied in about

Table V. Time delays in minutes (median, interquartile range) in patients with ACS*

	UA [%]	NSTEMI [%]	STEMI [%]
Onset of symptoms to admission (n=60 120)	432 (169-1790)	405 (160-1498)	260 (132-750)
Admission to thrombolysis (n=1482)	–	–	25 (15-45)
Onset of symptoms to thrombolysis (n=1453)	–	–	185 (115-350)
Admission to first balloon inflation (n=17 380)	683 (118-2405)	180 (60-1429)	50 (32-85)
Onset of symptoms to first balloon inflation (n=16 810)	2240 (810-6315)	1350 (476-4310)	310 (195-615)

Abbreviations: see Table I
** Detailed information was available since June 2005. Exact numbers of patients are shown in parentheses*

30% of patients which gave a low rate of PCI in UA (29%) and NSTEMI (32%). In STEMI, almost two-thirds of patients had coronary angiography performed and nearly all of them had subsequent PCI for treatment of the culprit lesion in the infarct-related artery. Thrombolysis was incidentally used in NSTE-ACS (<1%) mainly due to in-hospital progression to STEMI. In STEMI patients, thrombolysis was administered in 9.3% of patients (in 7.8% as the only reperfusion therapy and in 1.5% with subsequent PCI procedure). The most frequent reason why thrombolysis was not given was intended primary PCI (in 54.0%). The other reported reasons were late presentation in 11.5%, other contraindications in 5.0%, and other causes or unknown reasons in 29.5%. Altogether, 63.3% of patients received reperfusion therapy for STEMI.

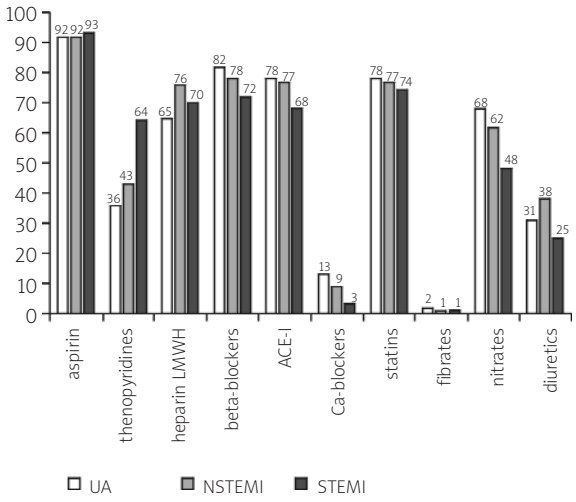

Figure 2. In-hospital medical therapy for patients with acute coronary syndromes (white bars – UA, grey – NSTEMI, black – STEMI)

Abbreviations: ACE-I – angiotensin-converting enzyme inhibitor, LMWH – low-molecular-weight heparin, NSTEMI – non-ST-segment elevation myocardial infarction, STEMI – ST-segment elevation myocardial infarction, UA – unstable angina

The GP IIb/IIIa inhibitors were used in a small number of patients with NSTE-ACS and in a minority of STEMI patients (16%). In fact, these agents were given mostly to patients who were treated invasively. In about 45% of patients treated with PCI and receiving GP IIb/IIIa inhibitor, this drug was used as a bailout therapy during the procedure. Stents were implanted in 85-90% of PCI procedures. The use of drug-eluting stents during PCI varied from 5.7% in UA to 0.9% in STEMI patients. Intra-aortic balloon pump was used more frequently in STEMI (1.1%) than in patients with NSTE-ACS (<0.5%). Coronary artery bypass grafting surgery (CABG) was performed during hospital stay in about 1% of patients and additionally 4-5% of patients were qualified for deferred CABG, more often in NSTE-ACS than in STEMI.

Time delays

Symptom onset-to-admission time was shorter in STEMI patients (median = 260 minutes, interquartile range = 132-750 minutes) than in patients with NSTE-ACS, in whom it was nearly twice as long (Table V).

For STEMI patients, in-hospital delays in initiation of reperfusion treatment were shorter for thrombolysis (median = 25 minutes) than for primary PCI (median = 50 minutes). Three-fourths of patients received thrombolysis in the first 45 minutes after admission and up to 6 hours from the onset of symptoms, while three-fourths of patients treated with PCI waited even up to 85 minutes from admission and 10 hours from the onset of symptoms for the first balloon inflation.

Patients with NSTE-ACS had to wait longer after admission to have PCI. In the UA group, the median delay was about 12 hours (interquartile range = 2-40 hours) whereas in patients with NSTEMI it was shorter (median = 3 hours) with the interquartile range being wide, from one to 24 hours.

In-hospital and discharge pharmacotherapy

The majority of patients received medical therapy that is currently recommended by the guidelines (Figure 2). The proportions of use were 92-93% for aspirin, 72-82% for beta-blockers, 68-78% for ACE inhibitors, and 74-78% for statins. Unfractionated or low-molecular-weight heparins were given to 65-76% of patients. The frequency of thienopyridine use was closely connected

with the rates of invasive treatment, and varied from 36% in UA to 64% in STEMI patients. Calcium blockers and nitrates were used more frequently in the NSTE-ACS patients.

Medical therapy prescribed to the patients at discharge was very similar to the in-hospital administration of these medications (Figure 3). The proportion of statins was even higher (81-82%) but aspirin was not prescribed in 14-15% of patients. At discharge, for 6-8% of patients low-molecular-weight heparin was continued. Diuretics were recommended in 20-30% of patients.

In-hospital outcomes

In-hospital outcomes are shown in Figure 4. Patients with UA had a low number of complications and a composite outcome (death, myocardial infarction or stroke) occurred in 1.3% of them. Usually analysed together with UA as NSTE-ACS, NSTEMI patients had several times worse outcome than UA patients. The rates of complications were much closer to those reported for STEMI patients. The NSTEMI patients had lower mortality (6.6 vs. 9.3%, p <0.0001), higher rates of recurrent MI (5.6 vs. 3.8%, p <0.0001), and similar incidence of stroke (0.6 vs. 0.7%, p=0.057) in comparison with STEMI patients. The composite outcome (death, recurrent MI or stroke) was lower only by 1% in the NSTEMI group (11.9%) than in the STEMI patients (p <0.0001).

Discussion

The PL-ACS registry is one of the largest national registries of ACS in Europe, providing the most current data on demography, treatment and outcomes of 100,000 patients in one European Union country. Being designed as a population-based registry, it managed to enrol patients from 78% of Polish centres that deal with ACS. Importantly, the academic or large centres were not favoured in order to obtain the most authentic picture of current practice. Furthermore, while one-fourth of the patients in PL-ACS were older than 75 years, and 40% were women, the registry covers a large part of the population that had usually been under-represented in randomised trials. Thus, the PL-ACS Registry could help in providing answers to many current issues in ACS.

At first, comments should be made on distribution of the initial diagnosis of ACS. In the PL-ACS registry, more than 40% of patients were initially diagnosed as having UA. The others were diagnosed as having MI, with slightly more STEMI (31%) than NSTEMI (27%). The recent data from Europe show a lower proportion of UA among ACS patients [7, 13]. Thus, it is possible that some of the patients were overdiagnosed because the criteria

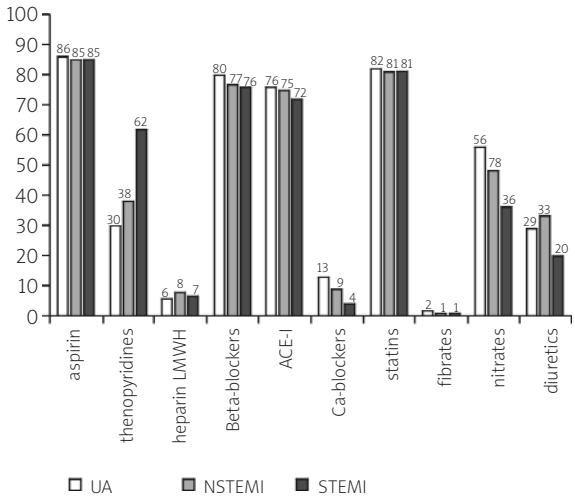

Figure 3. Medications prescribed at discharge for surviving patients with ACS (white bars – UA, grey – NSTEMI, black – STEMI)

Abbreviations: see Figure 2

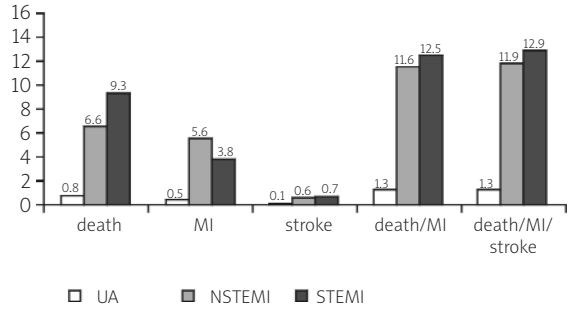

Figure 4. In-hospital outcomes of ACS* (white bars – UA, grey – NSTEMI, black – STEMI)

Abbreviations: MI – myocardial infarction; others – see Figure 2
** p <0.001 for all pair comparisons except for stroke in NSTEMI vs. STEMI where p=0.06*

for UA were rather liberal and did not require ECG changes. In fact, typical ischaemic ECG abnormalities were present only in about 60% of UA patients. However, they were managed as UA patients with all the ensuing consequences.

One of the unresolved problems in managing patients with ACS is that a significant number of them are hospitalised in non-cardiology wards (mostly internal medicine ones), where accessibility to recommended treatment is limited [7, 14]. In Poland, it takes place in one-third of NSTE-ACS and about one-fifth of STEMI patients, even after inter-hospital transfer. This means that every fourth patient with ACS is treated by a non-cardiology specialised team of physicians.

Adherence to guidelines' recommended treatment

Unstable angina

About one-third of patients with UA were hospitalised in centres with PCI facilities and had coronary angiography performed. In 65% of them PCI or CABG during index hospitalisation were performed. In UA, guidelines recommend early invasive strategy only in high-risk patients [2, 4]. In view of that, the proportion of revascularisation could be satisfactory compared with the European part of the GRACE (Global Registry of Acute Coronary Events) registry (coronary angiography in 37%, of which 65% were revascularised) [13]. Additionally, although in the outside-Europe GRACE dataset the rate of coronary angiography was 50%, the percentage of subsequent revascularisations was lower (56%), being similar to the European data in absolute numbers [13].

In-hospital usage of the guidelines' recommended medical therapy was high in UA and even higher than in the NSTEMI and STEMI patients, being also higher than in GRACE [13]. Similar trends were observed in medications prescribed at discharge. However, thienopyridines were given mainly together with invasive treatment and were rarely used with non-invasive strategy, which resulted in their low usage.

Non-ST-segment elevation myocardial infarction

Current guidelines link together UA and NSTEMI in NSTE-ACS, even though there are substantial differences in outcomes between these two types of ACS [2, 4-5]. We found that management of NSTEMI was very similar to UA but the outcomes were much closer to STEMI patients. Only 40% of NSTEMI patients were hospitalised in PCI centres and no more than one-fourth were revascularised. Unfortunately, comparable trends were also observed in the other registries [7-8, 13, 15]. Thus, efforts should be made to shift the invasive approach to high-risk NSTE-ACS patients and to shorten the delay from symptom onset to intervention.

In-hospital and discharge usage of the guidelines' recommended medical therapy was high except for thienopyridines and GP IIb/IIIa inhibitors. At the time of the study, GP IIb/IIIa inhibitors were not refunded by the National Health Fund for patients with NSTE-ACS during the enrolment period, which undoubtedly determined their low usage.

ST-segment elevation myocardial infarction and reperfusion treatment

Primary reperfusion therapy was received by 63.3% of patients with STEMI. Compared to the EHS ACS-II (Second Euro Heart Survey on Acute Coronary Syndromes) registry (63.9%) [8] and the European part of the GRACE registry (65%) [13], Poland represents an average country in Europe, although with a higher proportion of primary PCI to thrombolysis (6 to 1). However, one-third of patients did not receive reperfusion treatment. The median time from admission to reperfusion was still much shorter for thrombolysis, but the median absolute difference was only 25 minutes.

Guidelines' recommended medical treatment prescribed at discharge was acceptably high but in-hospital use of beta-blockers and ACE inhibitors was lower than in the NSTE-ACS patients. The use of GP IIb/IIIa inhibitors was relatively low in invasively treated patients as compared to recent data from the registries [8, 13].

In-hospital outcomes

In-hospital mortality of patients with STEMI was slightly higher as compared to the GRACE and EHS ACS-II registries [8, 13]. The possible reason for that is the more population-based approach of the PL-ACS registry, with a large number of small, non-cardiology-specialised hospitals included. Patients with NSTEMI had lower in-hospital mortality. However, the incidence of recurrent infarction was higher in NSTEMI than STEMI patients, probably due to a lower rate of invasive treatment. The proportion of patients suffering from stroke was low. This overall resulted in a comparable combined outcome (death, recurrent MI or stroke) in NSTEMI and STEMI. Unstable angina patients had a favourable combined outcome (1.3%).

Limitations

Although the PL-ACS registry has a population-based approach, the proportion of participating centres was 78% and selection bias could have occurred. Additionally, not all contributing hospitals enrolled patients through all the duration of the registry. Finally, the data come from one country, which probably is not representative of the general population of patients with ACS and of the hospitals admitting these patients in other countries and continents. Therefore, the results of this registry should be generalised with caution to other countries or regions. Because site audits were not routinely performed, we were unable to check if the initial diagnosis was correctly established. At present, we do not report follow-up data and all findings concerning the outcomes should be interpreted with caution.

Conclusions

The Polish Registry of Acute Coronary Syndromes, with a large number of enrolled patients from more than four hundred hospitals, provides reliable data on current medical practice in one of the largest countries of the European Union. It shows several discrepancies between guidelines' recommended treatment and their utilisation in everyday practice. Particularly, the under-utilisation of invasive treatment in patients with NSTEMI and application of invasive procedures to patients with a lower risk profile is alarming. Efforts should be made to shift the invasive burden to NSTEMI patients and to shorten the delay from symptom onset to intervention.

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APPENDIX

Organization of the PL-ACS Registry

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Ogólnopolski Rejestr Ostrych Zespołów Wieńcowych (PL-ACS)

Charakterystyka kliniczna, leczenie i rokowanie chorych z ostrymi zespołami wieńcowymi w Polsce

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Streszczenie

Wstęp: Wraz z transformacją systemu politycznego w Polsce zreformowany został również system opieki zdrowotnej. Dzięki temu zwiększyła się dostępność w szpitalach do nowoczesnych, aktualnie obowiązujących sposobów leczenia ostrych zespołów wieńcowych (OZW).

Cel: Zebranie aktualnych danych o epidemiologii, sposobie leczenia i rokowaniu chorych z OZW w Polsce oraz ocena zgodności stosowanej strategii leczenia z wytycznymi.

Metodyka: Do analizy włączono 100 193 chorych hospitalizowanych z powodu niestabilnej choroby wieńcowej, zawału serca bez uniesienia odcinka ST (NSTEMI) oraz zawału serca z uniesieniem odcinka ST (STEMI), prospektywnie włączanych w 417 szpitalach w okresie od października 2003 do marca 2006 r. do Ogólnopolskiego Rejestru Ostrych Zespołów Wieńcowych PL-ACS. Rejestr jest realizowany we współpracy z Ministerstwem Zdrowia i Narodowym Funduszem Zdrowia.

Wyniki: Z łącznej liczby chorych 42,2% było hospitalizowanych z powodu niestabilnej choroby wieńcowej, 26,6% z powodu NSTEMI, a 31,2% z powodu STEMI. Około 1/3 chorych była leczona na oddziałach innych niż kardiologiczne (głównie na oddziałach chorób wewnętrznych). W OZW bez uniesienia odcinka ST strategię inwazyjną (wczesną koronarografię) stosowano podobnie często w niestabilnej chorobie wieńcowej (29,4%) i w NSTEMI (31,7%). Tym niemniej śmiertelność wewnątrzszpitalna była niska w niestabilnej chorobie wieńcowej (0,8%) w porównaniu z 6,6% w NSTEMI ($p < 0,0001$). W STEMI terapię reperfuzyjną zastosowano u 63,3% chorych (trombolizę – u 7,8%, pierwotną angioplastykę wieńcową – u 54,1%, angioplastykę po leczeniu fibrynolitycznym – u 1,4%). Śmiertelność wewnątrzszpitalna w STEMI wyniosła 9,3%. Mediana czasu od pojawienia się objawów do leczenia inwazyjnego wyniosła 37 godz. w niestabilnej chorobie wieńcowej, 23 godz. w NSTEMI i 5 godz. w STEMI. Zalecana przez wytyczne farmakoterapia była stosowana u wysokiego odsetka chorych, z wyjątkiem tienopirydyn i blokerów receptora GP IIb/IIIa.

Wnioski: Ogólnopolski Rejestr Ostrych Zespołów Wieńcowych wskazuje, iż wiele zalecanych przez wytyczne sposobów postępowania w OZW nie jest odpowiednio często realizowanych w praktyce klinicznej. Szczególnie niepokojący jest niski odsetek leczenia inwazyjnego chorych z NSTEMI. Należy podjąć działania, aby zwiększyć odsetek chorych z NSTEMI leczonych inwazyjnie oraz skrócić czas od wystąpienia objawów do interwencji.

Słowa kluczowe: ostre zespoły wieńcowe, rejestr, epidemiologia, rokowanie wewnątrzszpitalne, wytyczne

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