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Decrease in annual incidence of acute coronary syndrome and restructuring of coronary care in Latvia

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Klíčová slova:
Akutní koronární syndrom
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Zdravotnická záchranná služba

SOUHRN

Úvod: Zdokonalení prevence a léčby ischemické choroby srdeční i zvýšení dostupnosti koronárních jednotek představují významná opatření pro snížení incidence akutních koronárních syndromů (AKS). Pro optimální algoritmus hospitalizace a léčby pacientů s AKS je naprosto nezbytné vytvoření systému akutní koronární péče.
Cíl: Cílem naší studie bylo stanovit roční incidenci AKS i kvalitu akutní koronární péče v Litvě.
Metody: Byly analyzovány údaje Litevského registru akutních koronárních syndromů za období 2005 až 2010.
Výsledky: Od roku 2005 se roční incidence hospitalizací pro AKS v Litvě statisticky významně snížila. Podle údajů registru klesla v daném šestiletém období roční incidence AKS bez elevací úseku ST (non-ST AKS) v absolutních číslech z 8 019 na 4 613. Bylo prokázáno důslednější uplatňování léčby podle doporučených postupů i časné invazivní strategie u pacientů s AKS. Zvýšily se počty primárních koronárních intervencí ze 7,9 % v roce 2005 na 57,0 % v roce 2010; výsledkem bylo snížení podílu pacientů se STEMI, u nichž vůbec nebyla provedena reperfuzní léčba (ze 45 % v roce 2005 na 21 % v roce 2010).
Závěry: V období 2005 až 2010 došlo v Litvě k poklesu roční incidence hospitalizací pro AKS, zvláště non-STE AKS, i ke zlepšení léčby AKS podle doporučených postupů.

Keywords:
Acute coronary syndrome
Emergency medical services
Primary percutaneous coronary intervention

ABSTRACT

Introduction: Improvement in coronary heart disease prevention and treatment, as well as availability of coronary care facilities, are important measures for reduction of acute coronary syndrome (ACS) incidence. Centralized acute coronary care system is crucial to provide optimal hospitalization and management algorithm for ACS patients.
Aim: The aim of the current report was to assess annual incidence of ACS, and quality of acute coronary care in Latvia.
Methods: The data from The Latvian Registry of Acute Coronary Syndromes were analyzed covering the time period from year 2005 to year 2010.
Results: Since the year 2005 the annual incidence of hospitalization due to ACS decreased significantly in Latvia. Annual incidence of non-ST-elevation ACS (NSTE-ACS) decreased from 8 019 to 4 613 in absolute numbers based on the registry data during six years. Improvement in use of guidelines based therapy and early invasive strategy in ACS patients was observed. Increase in primary percutaneous coronary intervention was achieved from 7.9% in year 2005 to 57.0% in year 2010 contributing to reduction in proportion of STEMI patients without any reperfusion (from 45% in year 2005 to 21% in year 2010).
Conclusions: Annual incidence of hospitalized ACS, especially NSTE-ACS decreased, and guidelines based management of ACS improved from 2005 to 2010 in Latvia.

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Introduction

Continuous physician education, development of clinical guidelines and recommendations, and its implementation in practice, availability of diagnostic coronary angiography and coronary intervention are measures that are crucial in reduction of acute coronary syndrome (ACS) morbidity. Moreover, centralized emergency medical services (EMS) are vital in order to promote optimal algorithm of hospitalization or the transfer to specialized hospitals to provide best possible care for patients with ACS. ACS registry, covering the whole country, represents both consequences of primary and secondary prevention by decreasing incidence of ACS as well as serves as a measure for quality of care in patients hospitalized with ACS.

The new member states of the European Union have high cardiovascular disease rates, which is in marked contrast to the most economically stable European countries where declines in cardiovascular mortality rates have been experienced over last 30 years [1]. Coronary heart disease is the leading cause of death in Latvia [2]. ACS is the most common reason for cardiac hospitalization tied with high mortality risk and requiring advanced care [3].

Early coronary angiography and revascularization is a cornerstone in contemporary management of ACS, however, improvement of regionalized systems is of no less importance [4–7]. In patients with ST-segment elevation myocardial infarction (STEMI) primary percutaneous coronary intervention (P-PCI) in a time saving manner is the preferred strategy. Thus empowering EMS and implementation of regional guidelines were the first steps in forming an effective STEMI regional network providing majority of patients with P-PCI and others with fibrinolysis (FL) and facilitated PCI. Additionally early invasive strategy in non-ST-elevation ACS (NSTE-ACS) patients reduces refractory ischemia and improves survival in intermediate and high risk NSTE-ACS patients [5,8–14].

Assessment of quality has become an integral part of care, usually by the evaluation of implementation of clinical guidelines in real life practice. Thus, to analyze acute coronary care quality in Latvia, the ongoing national registry of ACS was introduced in the year 2005. The aim of this report was to analyze annual incidence of ACS and quality of care in ACS patients during the time period of 5 years from 2005 to 2010 in Latvia.

Methods

The Latvian Registry of Acute Coronary Syndromes is an ongoing, prospective, multi-center, observational registry designed to examine current epidemiology, in-hospital management and the outcome of patients with ACS in Latvia. A total of 34 hospitals participated in the registry during study period from 1st of January 2005 to 31st of December 2010. To minimize selection bias all consecutive patients with a suspected diagnosis of acute coronary syndrome were included, regardless of the treatment strategy, or outcome. Data concerning baseline demographic and clinical characteristics, relevant laboratory results, pharmacotherapy during hospital stay, and adverse cardiovascular outcomes were recorded on a standardized electronic

Table 1 – Characteristics of NSTE-ACS patients.

	2005	2006	2007	2008	2009	2010	*p*-value
Number of patients, n	8 019	6 437	5 573	6 184	4 437	4 613	
Cardiogenic shock, n (%)	80 (1.0)	131 (2.0)	122 (2.2)	153 (2.5)	117 (2.6)	65 (1.4)	< 0.0001
Intra-hospital death, n (%)	269 (3.4)	258 (4.0)	284 (5.1)	348 (5.6)	230 (5.2)	166 (3.6)	< 0.0001
Age ± SD, years	68.32 ± 11.29	68.59 ± 11.26	68.67 ± 11.41	69.73 ± 11.40	69.25 ± 11.69	68.84 ± 11.61	< 0.0001
Arterial hypertension, n (%)	5 033 (62.8)	4 345 (67.5)	3 753 (67.3)	4 254 (68.8)	2 820 (63.6)	2 911 (63.1)	< 0.0001
Diabetes mellitus, n (%)	1 424 (17.8)	1 145 (17.8)	1 001 (18.0)	1 136 (18.4)	807 (18.2)	918 (19.9)	0.051
Hypercholesterolemia (TC > 4.5 mmol/l), n (%)	3 905 (48.8)	2 845 (44.2)	2 927 (52.5)	3 243 (52.4)	2 247 (50.6)	2 094 (45.4)	< 0.0001
Previous myocardial infarction, n (%)	3 170 (39.5)	2 404 (37.3)	2 079 (37.3)	2 304 (37.3)	1 604 (36.2)	1 562 (33.9)	< 0.0001
Previous stroke, n (%)	519 (6.5)	415 (6.4)	363 (6.5)	407 (6.6)	275 (6.2)	269 (5.8)	0.651
Atrial fibrillation, n (%)	1 434 (17.9)	1 177 (18.3)	1 005 (18.0)	1 151 (18.6)	718 (16.2)	638 (13.8)	< 0.0001
PCI at index hospitalization, n (%)	507 (6.3)	663 (10.3)	621 (11.1)	719 (11.6)	1 016 (22.9)	1 295 (28.1)	< 0.0001
Coronary angiography at index hospitalization, n (%)	–	–	859 (15.4)	1031 (16.7)	1391 (31.4)	1699 (36.8)	< 0.0001
Aspirin, n (%)	7 250 (90.4)	5 817 (90.4)	5 004 (89.8)	5 583 (90.3)	3 988 (89.9)	4 056 (87.9)	< 0.0001
Thienopyridines, n (%)	1 384 (17.3)	2 249 (34.9)	2 804 (50.3)	3 232 (52.3)	2 744 (61.8)	3 406 (73.8)	< 0.0001
ACE-inhibitors, n (%)	5 802 (72.4)	4 877 (75.8)	4 031 (72.3)	4 473 (72.3)	3 060 (69.0)	3 027 (65.6)	< 0.0001
Beta-blockers, n (%)	6 740 (84.1)	5 405 (84.0)	4 635 (83.2)	5 133 (83.0)	3 697 (83.3)	3 866 (83.8)	0.471
Statins, n (%)	5 316 (66.3)	5 069 (78.7)	4 557 (81.8)	5 052 (81.7)	3 781 (85.2)	3 941 (85.4)	< 0.0001
GP IIb/IIIa inhibitors, n (%)	255 (3.2)	409 (6.4)	486 (8.7)	517 (8.4)	429 (9.7)	352 (7.6)	< 0.0001

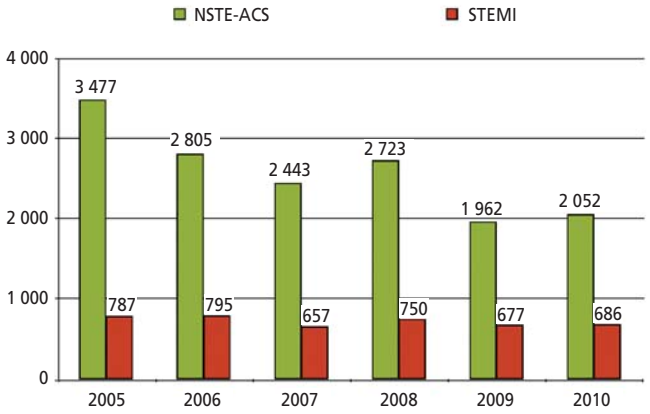

Fig. 1 – Annual incidence of STEMI and NSTE-ACS according to ACS registry calculated per million inhabitants of Latvia.
* According to Central Statistical Bureau Database of Latvia resident population at the beginning of the following years were: 2,306,434 in 2005, 2,294,590 in 2006, 2,281,305 in 2007, 2,270,894 in 2008, 2,261,294 in 2009 and 2,248,374 in 2010.

web page based case report form. Data were collected in a central electronic database. Standardized definitions were used for adverse events and final diagnosis [15,16]. For the purpose of the present analysis patients were classified as NSTE-ACS and STEMI. The occurrence of other ischemic or bleeding events was not analyzed. We analyzed: adherence to therapies recommended by guidelines, early interventional strategy, coronary risk factors, patient history data and in-hospital mortality. Hypercholesterolemia was defined as total blood cholesterol above 4.5 mmol/l, and arterial hypertension was defined as blood pressure 140/90 mmHg or above without medications or the use of antihypertensive agents in history.

Reperfusion strategy was documented in STEMI patients. STEMI patients eligible for reperfusion therapy were defined as patients hospitalized within 12 h from symptom onset. Reperfusion strategy, P-PCI or fibrinolysis (FT) was analyzed in this patient subgroup.

The data of Central Statistical Bureau Database of Latvia were used for the calculation of annual incidence of STEMI and NSTE-ACS per million population. This was calculated for each year using number of total population for each year given by Central Statistical Bureau Database of Latvia.

Statistical analyses

Statistical analyses were performed with SPSS software (version 17.0, Chicago, Illinois, USA). Continuous values are expressed as mean ± SD. Categorical variables are presented as percentages. Categorical variables were compared with Chi-square test and continuous variables with ANOVA. *P* values under 0.05 were considered as statistically significant.

Results

Since the year 2005 the total number of ACS patients, both STEMI and NSTE-ACS, hospitalized across Latvia as assessed by current registry decreased (Tables 1 and 2). Number of STEMI and NSTE-ACS calculated per million population decreased over years (Fig. 1). More prominent decrease was observed among NSTE-ACS patients. To-

Table 2 – Characteristics of STEMI patients.

	2005	2006	2007	2008	2009	2010	*p*-value
Number of patients, n	1 815	1 823	1 499	1 703	1 530	1 542	
Cardiogenic shock, n (%)	156 (8.6)	198 (10.9)	123 (8.2)	158 (9.3)	198 (12.9)	157 (10.2)	< 0.0001
Intra-hospital death, n (%)	312 (17.4)	288 (15.8)	208 (13.9)	270 (15.9)	219 (14.3)	206 (13.4)	0.01
Age ± SD, years	67.49 ± 12.07	66.85 ± 12.33	65.81 ± 12.48	67.16 ± 12.36	65.56 ± 13.15	65.90 ± 12.58	< 0.0001
Arterial hypertension, n (%)	872 (48.0)	981 (53.8)	755 (50.4)	898 (52.7)	733 (47.9)	712 (46.2)	< 0.0001
Diabetes mellitus, n (%)	298 (16.4)	324 (17.8)	235 (15.7)	266 (15.6)	219 (14.3)	205 (13.3)	0.008
Hypercholesterolemia, n (%), TC > 4.5 mmol/l	907 (50.2)	966 (53.0)	911 (60.8)	1 007 (59.1)	959 (62.7)	959 (62.2)	< 0.0001
Previous myocardial infarction, n (%)	422 (23.3)	400 (22.0)	305 (20.3)	337 (19.8)	273 (17.8)	243 (15.8)	< 0.0001
Previous stroke, n (%)	126 (6.9)	149 (8.2)	113 (7.5)	137 (8.0)	107 (7.0)	88 (5.7)	0.077
Atrial fibrillation, n (%)	222 (12.2)	221 (12.1)	173 (11.5)	209 (12.3)	149 (9.7)	153 (9.9)	0.051
PCI at index hospitalization, n (%)	242 (13.3)	400 (22.0)	506 (33.8)	542 (31.8)	890 (58.2)	1038 (67.3)	< 0.0001
Coronary angiography at index hospitalization, n (%)	–	–	523 (34.9)	582 (34.2)	948 (62.0)	1076 (69.8)	< 0.0001
Aspirin, n (%)	1 703 (93.8)	1 712 (93.9)	1 412 (94.2)	1 593 (93.5)	1 465 (95.8)	1 475 (95.7)	0.013
Thienopyridines, n (%)	548 (30.2)	1 153 (63.2)	1 232 (82.2)	1 398 (82.1)	1 380 (90.2)	1 458 (94.6)	< 0.0001
ACE-inhibitors, n (%)	1 222 (67.3)	1 269 (69.6)	997 (66.5)	1 130 (66.4)	1 021 (66.7)	962 (62.4)	0.001
Beta-blockers, n (%)	1 523 (83.9)	1 490 (81.7)	1 276 (85.1)	1 430 (84.0)	1 298 (84.8)	1 272 (82.5)	0.061
Statins, n (%)	1 456 (80.2)	1 566 (85.9)	1 318 (87.9)	1 478 (86.8)	1 374 (89.8)	1 369 (88.8)	< 0.0001
GP IIb/IIIa inhibitors, n (%)	195 (10.7)	314 (17.2)	452 (30.2)	478 (28.1)	665 (43.5)	721 (46.8)	< 0.0001

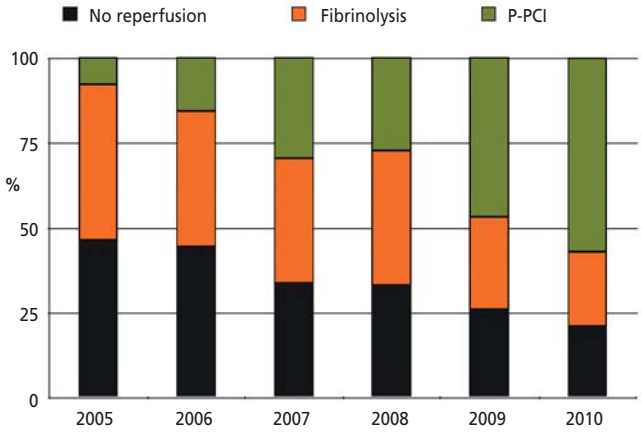

Fig. 2 – Reperfusion in STEMI patients hospitalized within 12 hours after symptom onset in Latvia.

tal number of patients hospitalized with NSTE-ACS decreased almost two fold based on registry data. Early interventional strategy and better adherence to guidelines recommended therapies improved in NSTE-ACS patients over years (Table 1). Reduction in intra-hospital mortality was observed in year 2010 in NSTE-ACS patients (Table 1).

The use of P-PCI in Latvia significantly increased from 7.9% in 2005 to 57.0% in 2010 along with use of antiplatelet therapy (Tables 2 and 3). The most prominent increase was observed in use of clopidogrel – 30.2% in 2005 compared with 94.6% in 2010. Supplementary with increase in PCI rates use of GP IIb/IIIa inhibitors rose from 10.7% in 2005 to 46.8% in 2010. Proportion of STEMI patients without any reperfusion decreased from 46.3% in year 2005 to 20.8% in 2010 (Fig. 2). However, only slight decrease of intra-hospital mortality in STEMI patients over years was observed. Intra-hospital mortality rates in STEMI patients without any reperfusion remained very high (Table 4).

Absolute numbers of transferred patients from community hospitals to PCI centers increased over years (Fig. 3).

Discussion

The main challenges in last twenty years have been the reduction of incidence of cardiovascular disease and the reduction of cardiovascular mortality. For this purpose continuous education of cardiologists, emergency care specialists and general practitioners has been implemented. Multiple, regular educational seminars and congresses were held during this time period across the country, and local guidelines on acute coronary care were developed in 2006 and updated in 2011. Local recommendations on stable coronary disease and coronary prevention were developed and implemented in real life practice. Besides availability of coronary care services such as diagnostic coronary angiography, coronary intervention, exercise test and non-invasive cardiac imaging have remarkably improved. For example, annual increase of diagnostic coronary angiograms have risen from 2 258 in 2005 to 5 643 in 2010 per million population with respective increase in PCI from 1 169 to 2 859 per million population in Latvia. Increase in coronary interventions was achieved with education of new interventional cardiologists, the opening of new catheterization laboratories and interventional centers. Since 2003 two university hospitals provide interventional coronary care in Riga. Two additional interventional centers in 2007 were opened in two other cities (Daugavpils and Liepaja) both situated more than 200 kilometers from the capital Riga.

Evaluation of intra-hospital acute coronary care confirmed better adherence to evidence-based guidelines. Not only more frequent administration of recommended drugs but also more common use of diagnostic coronary angiograms followed by PCI was observed. Increase in the use of interventional strategy in the management of

Table 3 – Characteristics of STEMI patients hospitalized within 12 hours after symptom onset.

	2005	2006	2007	2008	2009	2010	*p*-value
Number of patients, n	1 290	1 365	1 082	1 236	1 112	1 132	
Cardiogenic shock, n (%)	117 (9.1)	153 (11.2)	98 (9.1)	121 (9.8)	166 (14.9)	131 (11.6)	< 0.0001
Intra-hospital death, n (%)	216 (16.7)	222 (16.3)	143 (13.2)	189 (15.3)	165 (14.8)	161 (14.2)	0.135
Age ± SD, years	67.20 ± 11.78	66.61 ± 12.58	65.79 ± 12.36	67.08 ± 12.19	65.89 ± 13.47	66.20 ± 12.60	0.018
Reperfusion							
Fibrinolysis, n (%)	591 (45.8)	541 (39.7)	396 (36.6)	489 (39.6)	302 (27.2)	250 (27.2)	< 0.0001
Primary PCI, n (%)	102 (7.9)	215 (15.8)	322 (29.8)	339 (27.4)	522 (46.9)	645 (57.0)	< 0.0001
Without reperfusion, n (%)	597 (46.3)	605 (44.3)	364 (33.6)	408 (33.0)	288 (25.9)	236 (20.8)	< 0.0001
PCI at index hospitalization, n (%)	184 (14.3)	313 (23.0)	387 (35.8)	420 (34.0)	650 (58.5)	738 (65.2)	< 0.0001
Aspirin, n (%)	1 222 (94.7)	1 280 (93.8)	1 029 (95.1)	1 170 (94.7)	1 061 (95.4)	1 077 (95.1)	0.514
Thienopyridines, n (%)	415 (32.2)	892 (65.3)	905 (83.6)	1 035 (83.7)	1 011 (90.9)	1 064 (94.0)	< 0.0001
ACE-inhibitors, n (%)	867 (67.2)	939 (68.8)	728 (67.3)	827 (66.9)	729 (65.6)	684 (60.4)	< 0.0001
Beta-blockers, n (%)	1 092 (84.7)	1 116 (81.8)	928 (85.8)	1 050 (85.0)	934 (84.0)	920 (81.3)	0.013
Statins, n (%)	1 048 (81.2)	1 173 (86.0)	957 (88.4)	1 083 (87.6)	1 002 (90.1)	998 (88.2)	< 0.0001
GP IIb/IIIa inhibitors, n (%)	144 (11.2)	253 (18.5)	355 (32.8)	372 (30.1)	491 (44.2)	568 (50.2)	< 0.0001

both NSTE-ACS and STEMI was the result of not only physician education and availability of interventional centers, but also restructuring and centralization of EMS in Latvia.

Admission to higher-volume hospitals was associated with a reduction in mortality for acute myocardial infarction according to literature [17], thus number of small capacity community hospitals was restructured to serve as ambulatory clinics and total number of hospitals providing acute coronary care was reduced from 35 in year 2005 to 18 in year 2010. Reduction of low capacity hospitals in acute coronary care network provides possibility for ACS patients to be hospitalized to higher-volume centers, thus expecting better quality of care and prognosis.

Majority of patients with ACS arrive at the hospital via EMS ambulance in Latvia, thus EMS plays a crucial role in the distribution of ACS patients among hospitals. EMS was restructured and served as a centralized system ensuring hospitalization of ACS patients to tertiary centers only since 2009–2010. STEMI network algorithms were adapted from European Society of Cardiology recommendations and adjusted for local situation, published in local guidelines and implemented in real life practice [4–6]. Thus, more STEMI patients were routed directly to interventional centers or transferred on the next day after FL if more than 2-hour delay from the first medical contact to balloon was expected. As a result significant increase in use of P-PCI from 7.9% in 2005 to 57.0% in 2010 and decrease in STEMI patients without any reperfusion was observed (Table 3, Fig. 2).

P-PCI is preferable and it is the leading reperfusion strategy for STEMI in most European countries [18], however, in the "real world" choice of a management strategy is often governed by the facilities available in the hospital where patients initially present. Only four hospitals in Latvia (two hospitals in Riga) have PCI facilities and 24-hour/7-day interventional access is available only in Riga (since 2007 one hospital and since February 2010 two hospitals).

Positive associations between interventional strategy and improved outcomes in patients with ACS argue for the routing of those patients from community hospitals to hospitals with access to catheterization laboratory [18–24]. Partly, problems were settled with better organization of networks among the EMS and P-PCI hospitals. This resulted in significant increase in absolute numbers of transferred patients from community hospitals to PCI centers over years (Fig. 2). Those patients were routed to Latvian Centre of Cardiology mainly for coronary intervention. 74.5% (n = 190) from transferred NSTE-ACS and 90.7% (n = 233) from transferred STEMI patients underwent interventional treatment at index hospitalization in year 2010. Coronary angiography was performed in 91.0% (n = 232) transferred NSTE-ACS and in 95.7% (n = 246) transferred STEMI patients in 2010.

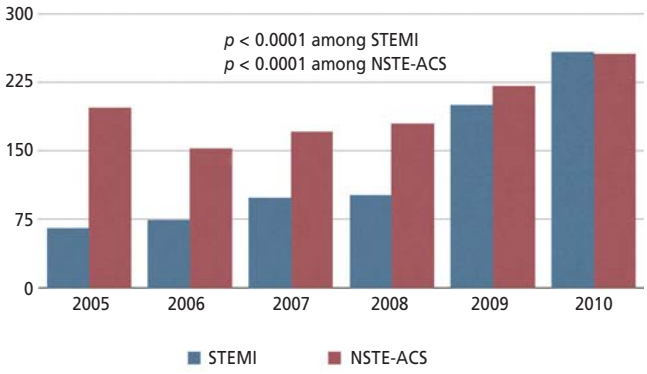

Fig. 3 – Absolute number of transferred patients from community hospitals to Latvian Centre of Cardiology.

Despite better adherence to guidelines recommended therapies only slight decrease in intra-hospital mortality was achieved. Very high intra-hospital death rates were observed in patient subgroup without any reperfusion (Table 4) contributing to high total intra-hospital mortality rates in STEMI patients. STEMI patients in cardiogenic shock had high in-hospital mortality, especially those without reperfusion ranging from 72 to 85% in this subset. Reperfused patients in cardiogenic shock had almost halved in-hospital morality rates compared to patients without reperfusion therapy. Patients in cardiogenic shock in P-PCI subgroup had worsened outcomes compared to fibrinolysis subgroup evaluating mortality rate alone. However, rates of P-PCI especially in last years have increased. P-PCI was widely applied in critically ill, resuscitated cardiogenic shock patients, and even in those with serious accompanying diseases possibly regarded as contraindication for FL.

In-hospital mortality rates in STEMI patients undergoing P-PCI in respect to percent from treated patients increased over years. However, in time period from 2005 to 2007 P-PCI was performed in selected patients, but since 2008 in Latvian Centre of Cardiology and since 2009 in Riga

Table 4 – In-hospital mortality in STEMI patients hospitalized within 12 hours after symptom onset.

Year	STEMI patients without cardiogenic shock			STEMI patients with cardiogenic shock			All STEMI patients		
	P-PCI	Fibrinolysis	Without reperfusion	P-PCI	Fibrinolysis	Without reperfusion	P-PCI	Fibrinolysis	Without reperfusion
2005, % (n)	1.2% (1)	10.3% (57)	17.0% (89)	17.6% (3)	41.7% (15)	81.0% (51)	4.0% (4)	12.2% (72)	23.9% (140)
2006, % (n)	0.5% (1)	6.6% (33)	17.2% (89)	33.3% (7)	55.6% (25)	75.9% (66)	3.7% (8)	10.7% (58)	25.6% (155)
2007, % (n)	0.3% (1)	9.3% (35)	16.5% (53)	50.0% (18)	26.3% (5)	72.1% (31)	5.9% (19)	10.1% (40)	23.1% (84)
2008, % (n)	0.3% (1)	10.9% (50)	18.6% (66)	47.4% (18)	44.8% (13)	75.9% (41)	5.6% (19)	12.9% (63)	26.2% (107)
2009, % (n)	2.6% (12)	9.4% (24)	13.6% (32)	54.5% (36)	34.0% (16)	84.9% (45)	9.2% (48)	13.2% (40)	26.7% (77)
2010, % (n)	3.1% (18)	11.9% (26)	19.3% (38)	58.3% (35)	43.8% (14)	76.9% (30)	8.2% (53)	16.0% (40)	28.8% (68)

Eastern Clinical University Hospital P-PCI policy for all--comers was initiated. Thus, critically ill patients as well as aging patients and patients with contraindications for other treatment options received P-PCI, which led to relatively higher in-hospital mortality rates in respect to percent from treated patients in this subset. Nonetheless, the total in-hospital mortality in STEMI patients (Tables 2 and 3) was decreasing over years, thus incremental benefit of more aggressive reperfusion in combination with better use of drug therapy could serve as explanation.

A higher proportion of STEMI patients were hospitalized in cardiogenic shock (8.6% in 2005 versus 10.2% in 2010) and higher proportion of patients in age group above 80 years (15.7% in 2005 vs. 18.4% in 2010 from all ACS patients), subgroup of patients with worsened prognosis. This registry is limited only with in-hospital data, which in terms of mortality is not the best reflection of quality of care, while guidelines based management, P-PCI in STEMI and early interventional strategy in NSTE-ACS are believed to reduce serious adverse cardiac events including mortality in longer term [6,7,10–14].

In NSTE-ACS patients intra-hospital death rate decreased in 2010 compared with 2006–2009, possibly reflecting better adherence to guidelines recommended therapy and intensified patient transfer from community hospitals to interventional centers.

Emergency care specialists, cardiologists, and general practitioners are being continuously educated; however, acceptable reperfusion rates in STEMI patients were not achieved. Insufficient amount of trained and experienced interventional cardiologists outside capital city is the main barrier for wider P-PCI implementation across the country. Until now some physicians and EMS specialists have conservative attitude towards early interventional strategy in STEMI as well as in NSTE-ACS. Thus, the development of ACS teams at community hospitals able to identify STEMI patients accurately as well as high and immediate risk NSTE-ACS eligible for P-PCI or early interventional treatment, correctly administer preferred initial medications, and rapidly transfer patients directly to the specialized center is still needed.

Conclusions

Annual incidence of ACS, especially NSTE-ACS as assessed by acute coronary syndrome registry decreased over years. Better adherence to guidelines recommended therapy and more often use of interventional strategy in analyzed time period from year to year was observed. A nationwide P-PCI strategy for STEMI was introduced in the previous years and subsequently the rate of P-PCI increased seven-fold since 2005. Nevertheless, still significant number of STEMI patients did not receive any reperfusion therapy resulting in high mortality rates in this subgroup. In NSTE-ACS intra-hospital death rate decreased and early interventional strategy increased from year to year in analyzed time period.

Conflict of interest

Authors have nothing to disclose concerning this manuscript.

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Ethical statement

The study was conducted under Good Clinical Practice conditions and according to ethical standards.

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