Prognostic importance of the extent of coronary revascularisation in patients with acute coronary syndromes and multivessel disease: one-year prospective follow-up

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Abstract

**Background:** Intervventional treatment improves prognosis in patients with acute coronary syndromes (ACS). However, despite introduction of percutaneous coronary intervention (PCI), the risk of cardiovascular events in patients with multivessel coronary artery disease (MVD) remains significant.

**Aim:** To evaluate the risk of complications and the prognostic value of MVD in patients with ACS during 1-year follow-up.

**Methods:** A group of 153 patients with ACS was followed up at a single cardiology unit with round-the-clock PCI capability. Treatment of ACS, the extent of revascularisation, and complications occurring during hospitalisation and 1-year follow-up were analysed. The end points of the study were defined as death from all causes, cardiac death, recurrent ACS and a composite end point (deaths from cardiac causes and recurrent ACS).

**Results:** During 1-year follow-up, 11 (7.2%) patients died, including 10 patients with MVD without complete revascularisation. Recurrent ACS occurred in 18 (12%) patients, including 13 patients with MVD without complete revascularisation. Presence of a residual significant coronary stenosis in incompletely revascularised patients with MVD was an important risk factor for all-cause mortality and occurrence of a composite endpoint in comparison to MVD patients who underwent complete revascularisation (p = 0.028 and p = 0.046, respectively) and patients with single-vessel disease (p = 0.006 and p = 0.003, respectively).

**Conclusions:** Incomplete revascularisation during the acute phase of ACS was associated with an increased risk of complications and a significantly increased risk of all-cause mortality and the combined rate of cardiovascular deaths and recurrent ACS. Single-stage PCI of all significant stenoses in MVD patients resulted in better outcomes.

**Key words:** acute coronary syndromes, multivessel disease, revascularisation, prognosis

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INTRODUCTION

Routine percutaneous coronary interventions (PCI), including balloon angioplasty (POBA) and stenting, along with modern antiplatelet therapy improved early and long-term prognosis in patients with acute coronary syndromes (ACS) [1, 2]. In patients with ST segment elevation myocardial infarction (STEMI), interventional treatment was shown to be superior to fibrinolytic therapy in regard to prevention of death, infarct extension, and recurrent infarction during both early and long-term follow-up. However, this benefit depends largely on restoration of complete coronary vessel patency, defined as Thrombolysis In Myocardial Infarction (TIMI) 3 flow [2–5]. In case of failed PCI and/or inability to restore complete patency of the infarct-related artery (IRA), incomplete reperfusion, or
the presence of multivessel disease (MVD), no improvement of the clinical status and prognosis of the patient is often seen during a longer-term follow-up. MVD, defined as the presence of significant stenoses in other coronary arteries than IRA, may thus constitute a major clinical problem and be associated with an increased risk of recurrent ACS [6–8]. These patients usually undergo staged PCI procedures or coronary artery bypass grafting (CABG), with simultaneous optimisation of drug therapy to stabilise atherosclerotic plaques [7, 9]. If MVD is found (which is the case in about 50% of STEMI patients), the interventional cardiologist and later the heart team must often make a difficult decision regarding the choice and timing of the intervention. Complete revascularisation is defined based on two aspects, anatomic and functional. The aim of complete anatomic revascularisation is to treat all significant coronary lesions regardless of the vessel diameter, or all significant lesions in vessels of a defined diameter. Complete functional revascularisation is defined as treating all significant coronary lesions in arteries supplying viable myocardium [10]. In STEMI patients and ACS patients with MVD, previous studies suggested superiority of an acute intervention limited to IRA, except for patients in cardiogenic shock or with significant stenoses (> 90% vessel diameter) of other coronary arteries, when it is indicated to perform single-stage PCI of all significant lesions. In practice, patients with MVD often undergo elective PCI or CABG several days to weeks after the initial primary PCI, often preceded by additional investigations to evaluate coronary reserve or myocardial viability [9]. Determination of the treatment strategy in case of non-STEMI in a patient with MVD is primarily based on individual judgment of the physician performing PCI, including the clinical status of the patients, severity of coronary artery disease (CAD), and risk scores [11].

The aim of the present study was to evaluate the prognostic importance of MVD, taking into account the extent of coronary revascularisation and the occurrence of treatment complications in ACS patients during a 1-year prospective follow-up.

**METHODS**

The study was conducted in 2007–2009 in the 2nd Ischaemic Heart Disease Department and Cardiac Catheterisation Laboratory at the Institute of Cardiology, Warsaw, Poland, and included 153 consecutive patients admitted due to ACS (STEMI or non-STEMI) and treated invasively based on the results of angiographic and clinical evaluation. Treatment strategy was determined based on individual judgment of the physician performing PCI, including the clinical status of the patients, severity of CAD, and risk scores. During follow-up visits every 6 months and in all cases of patient-reported symptoms, history was taken and non-invasive investigations were performed (ECG, 12-lead Holter ECG monitoring, echocardiography, and optionally stress testing). During 1-year follow-up, we recorded the following cardiac events: deaths (due to ACS or non-cardiac causes), recurrent ACS, and PCI and CABG procedures. Coronary angiography at 1 year was not obligatory but it was performed in case of suspected acute stent thrombosis, or following hospital discharge in case of recurrent angina and before elective PCI. Study data were collected during the index hospitalisation due to ACS, and using standardised forms during follow-up visits.

MVD was defined as the presence of a significant IRA stenosis (> 70% vessel diameter) or a > 50% stenosis of the left main coronary artery (left main disease — LMD) with additional significant stenosis (> 70%) of at least one other coronary artery. Complete revascularisation of MVD was defined as PCI or CABG of all significant coronary lesions during a single procedure. Incomplete revascularisation in patients with MVD was defined as the presence of residual significant coronary stenoses (> 70%) despite reperfusion therapy. Single vessel disease (SVD) was defined as the presence of a single significantIRA stenosis (> 70%) or LMD with a > 50% stenosis. Complete reperfusion in SVD was defined as complete IRA patency following PCI (POBA or stent implantation).

The study was supported by a grant from the Polish State Committee for Scientific Research (KBN) (2.46/III/06). The study protocol was approved by the Bioethics Committee at the Institute of Cardiology (approval No. 943/06).

**Statistical analysis**

Statistical analysis was performed using the SAS 9.2 package. Differences between categorical variables were evaluated using the χ² test or the exact Fisher test. Quantitative variables were tested, upon verification of their normal distribution, using the Student t test (2-group comparisons) or 1-way analysis of variance (3-group comparisons), with the Tukey’s test for post-hoc analyses. In case of irregular variable distributions (e.g., duration of hospital stay), variables were log-transformed to obtain appropriate skewness. Kaplan-Meier survival curves were plotted for selected endpoints (all-cause mortality and the combined endpoint of cardiac death and recurrent ACS), with various levels of revascularisation as the independent variable. The curves were compared using the log rank test. Multivariate Cox proportional hazard model was employed, upon visual verification of the required assumptions, to identify independent predictors of study endpoints. Two-sided null hypotheses were verified at p ≤ 0.05.

**RESULTS**

Among 153 patients included into the study, the final analysis included 149 patients with significant coronary lesions in whom the intervention was successful (TIMI 3) flow. The mean patient age was 63.2 ± 11.9 years. The mean duration of angina was 3.3 ± 2.8 h (range 5 min to 12 h). In the study group, STEMI was diagnosed in 105 (70.5%) patients, and non-STEMI was diagnosed in 44 (29.5%) patients.
SVD was present in 52 (35%) patients, and MVD was present in 97 (65%) patients.

Demographic and clinical characteristics of the study groups are shown in Table 1. No significant differences were found between the study groups in regard to conventional risk factors for CAD, such as hypertension, hyperlipidaemia, diabetes, smoking, and obesity.

Compared to the reference group of SVD patients, MVD patients in whom incomplete revascularisation was performed were significantly older, and more frequently had hypertension and a history of myocardial infarction. In contrast, they were less likely to have acute STEMI compared to MVD patients who underwent complete revascularisation. Killip class III–IV heart failure was diagnosed on admission in 25.5% of patients, and cardiogenic shock was significantly more frequent in MVD patients who underwent complete revascularisation compared to SVD patients ($p = 0.0087$).

In all study groups, significant coronary lesions were most commonly located in the left anterior descending (LAD) artery followed by the right coronary artery (RCA) (Table 2). In MVD patients in whom incomplete revascularisation was performed, LMD was significantly more frequent compared to SVD patients ($p = 0.0179$). The mean values of the Gensini score in the two groups of MVD patients (with complete or incomplete revascularisation) were significantly higher to the reference group of SVD patients ($p = 0.0027$ and $p < 0.0001$, respectively).

The patients were hospitalised for 8 to 17 (median 11) days regardless of the diagnosis. The median duration of hospital stay was 11 days in patients with acute STEMI and 10 days in patients with acute non-STEMI ($p = NS$).

PCI was performed within 4 h from the onset of pain in most patients ($n = 114, 76.5%$), and within 6 h in 133 (89.3%) patients. ACS was treated by opening of the occluded IRA significantly less frequently in SVD patients compared to MVD patients in whom incomplete revascularisation was performed. PCI with stenting (using bare-metal stents and drug-eluting stents) was performed in 128 patients, 7 patients

| Table 1. Study group characteristics in relation to the number of coronary lesions and the extent of revascularisation. Single vessel disease (SVD) with complete revascularisation was the reference group |
|--------------------------------------------------|----------------|----------------|----------------|----------------|
| Overall ($n = 149$) | SVD ($n = 52$) | MVD (+) ($n = 30$) | MVD (–) ($n = 67$) | |
| Age [years] | 63.2 ± 11.9 | 60.4 ± 12.5 | 63.7 ± 11.6 | 65.2 ± 11.4 | 0.24 | 0.0326 | 0.56 |
| Age > 70 | 50 (33.6%) | 14 (26.9%) | 12 (40%) | 24 (35.8%) | 0.22 | 0.30 | 0.69 |
| Male gender | 109 (73.2%) | 35 (67.3%) | 24 (80%) | 50 (74.6%) | 0.22 | 0.38 | 0.57 |
| BMI [kg/m²] | 27.9 ± 3.8 | 27.4 ± 4.1 | 28.3 ± 3.8 | 28.2 ± 3.7 | 0.32 | 0.28 | 0.93 |
| Hypertension | 96 (64.4%) | 27 (51.9%) | 20 (66.7%) | 49 (73.1%) | 0.19 | 0.0169 | 0.52 |
| Diabetes | 34 (22.8%) | 9 (17.3%) | 5 (16.7%) | 20 (29.9%) | 0.94 | 0.12 | 0.17 |
| Hyperlipidaemia | 103 (69.1%) | 32 (61.5%) | 21 (70%) | 50 (74.6%) | 0.44 | 0.13 | 0.63 |
| Smoking | 68 (45.6%) | 26 (50%) | 13 (43.3%) | 29 (43.3%) | 0.56 | 0.47 | 1.00 |
| Previous MI | 34 (22.8%) | 7 (13.5%) | 5 (16.7%) | 22 (32.8%) | 0.75 | 0.0146 | 0.10 |
| Previous PCI | 16 (10.7%) | 6 (11.5%) | 1 (3.3%) | 9 (13.4%) | 0.41 | 0.76 | 0.17 |
| Acute STEMI | 105 (70.5%) | 38 (73.1%) | 25 (83.3%) | 42 (62.7%) | 0.29 | 0.23 | 0.042 |
| Anterior wall ACS | 58 (38.9%) | 20 (38.5%) | 13 (43.3%) | 25 (37.3%) | 0.82 | 0.66 | 0.57 |
| Heart failure: | | | | |
| NYHA class II | 20 (13.4%) | 7 (13.5%) | 3 (10.0%) | 10 (14.9%) | | | |
| NYHA class III | 7 (4.7%) | 1 (1.9%) | 0 (0%) | 6 (9.0%) | | | |
| NYHA class IV | 11 (7.4%) | 1 (1.9%) | 6 (20%) | 4 (6.0%) | | | |
| Heart failure (Killip II, III, IV) | 38 (25.5%) | 9 (17.3%) | 9 (30%) | 20 (29.9%) | 0.18 | 0.11 | 0.99 |
| Pulmonary oedema | 7 (4.7%) | 1 (1.9%) | 0 (0%) | 6 (9.0%) | 1.0 | 0.13 | 0.17 |
| Shock | 11 (7.4%) | 1 (1.9%) | 6 (20%) | 4 (6.0%) | 0.0087 | 0.38 | 0.06 |
| Pulmonary oedema or cardiogenic shock | 18 (12.1%) | 2 (3.9%) | 6 (20%) | 10 (14.9%) | 0.0463 | 0.0465 | 0.56 |

MVD (+) — multivessel disease with complete revascularisation; MVD (–) — multivessel disease without complete revascularisation; ACS — acute coronary syndrome; BMI — body mass index; MI — myocardial infarction; NYHA — New York Heart Association; PCI — percutaneous coronary intervention; STEMI — ST segment elevation myocardial infarction
underwent both POBA and stenting, and 14 patients underwent POBA only. A single stent was implanted in 107 (71%) patients, 2 stents in 25 (17%) patients, 3 or 4 stents in 2 (2%) patients, and CABG was performed in 4 (2.6%) patients.

Single-stage complete revascularisation was performed in only 11 (11.3%) patients with MVD. Another 43 (44.3%) patients underwent second-stage elective PCI (within 1 month after the discharge), 38 (39%) patients were treated medically and 5 (5.1%) patients were referred for CABG. Elective PCI or CABG was performed in 32 (32.9%) patients with MVD, and complete staged revascularisation was obtained in only 19 (19.5%) patients. Overall, complete revascularisation was obtained in 30 (30.9%) patients with MVD.

Preprocedurally, all patients received acetylsalicylic acid (loading dose of at least 300 mg) and clopidogrel (300–600 mg), followed by standard maintenance doses of both drugs (75 mg daily). A glycoprotein IIb/IIIa inhibitor was used in 59 (39.5%) patients.

Complications were seen during the hospitalisation in 72 (48%) patients, including severe ventricular arrhythmia (ventricular tachycardia and ventricular fibrillation), episodes of atrial fibrillation, conduction and automaticity disturbances requiring temporary or persistent cardiac pacing, episodes of pulmonary oedema and exacerbated heart failure, bleedings of various locations, haematomas and pseudohaematomas at the puncture site, pneumonia, worsening of renal failure and hepatic failure, worsening of asthma/chronic obstructive pulmonary disease, strokes, resistant hypertension, left ventricular thrombi, acute mitral regurgitation, and pericarditis.

After ACS, patients were followed up for 1 year or until occurrence of a cardiac event (mean 210 ± 118 days). No deaths were noted among MVD patients who underwent complete revascularisation, while among MVD patients in whom complete revascularisation was not achieved, 10.4% of patients died due to ACS and 14.9% patients died due to ACS or non-cardiac causes (p < 0.05 for total mortality compared to the other groups). The combined endpoint was also more frequent in the MVD group without complete revascularisation (p = 0.0016 and p = 0.0460, respectively). Residual coronary stenoses in patients with MVD were also associated with an increased risk of New York Heart Association (NYHA) class III–IV heart failure and more frequent occurrence of ventricular tachycardia (p = 0.045 and p = 0.0286, respectively). The relative risk of combined endpoint in the MVD group without complete revascularisation was 2.8 (95% confidence interval [CI] 1.0–8.8, p = 0.0460) compared to the MVD group with complete revascularisation and 4.9 (95% CI 1.5–15.7, p = 0.0016) compared to the SVD group, and the risk in the MVD group with complete revascularisation compared to the SVD group was 1.7 (95% CI 0.4–8.1, p = NS).

Figures 1 and 2 show Kaplan-Meier curves for total mortality and the combined endpoint (cardiovascular death and ACS) in the MVD groups with or without complete revascularisation in the SVD group.

Table 2. Coronary angiographic findings and effects of intervention in patients with single vessel disease (SVD), multivessel disease with complete revascularisation [MVD (+)] and multivessel disease without complete revascularisation [MVD (–)]

<table>
<thead>
<tr>
<th>Overall (n = 149)</th>
<th>SVD (n = 52)</th>
<th>MVD (+) (n = 30)</th>
<th>MVD (–) (n = 67)</th>
<th>P — MVD (+) vs. SVD</th>
<th>P — MVD (–) vs. SVD</th>
<th>P — MVD (–) vs. MVD (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMCA &gt; 50%</td>
<td>7 (4.7%)</td>
<td>0</td>
<td>0</td>
<td>7 (10.5%)</td>
<td>NA</td>
<td>0.0179</td>
</tr>
<tr>
<td>LAD &gt; 70%</td>
<td>89 (59.7%)</td>
<td>20 (38.5%)</td>
<td>23 (76.7%)</td>
<td>46 (68.7%)</td>
<td>0.0008</td>
<td>0.0010</td>
</tr>
<tr>
<td>Diagonal branch &gt; 70%</td>
<td>34 (22.8%)</td>
<td>1 (1.9%)</td>
<td>8 (26.7%)</td>
<td>25 (37.3%)</td>
<td>0.0011 &lt; 0.0001</td>
<td>0.31</td>
</tr>
<tr>
<td>LCx &gt; 70%</td>
<td>57 (38.3%)</td>
<td>11 (21.2%)</td>
<td>12 (40%)</td>
<td>34 (50.8%)</td>
<td>0.07</td>
<td>0.0010</td>
</tr>
<tr>
<td>Marginal branch &gt; 70%</td>
<td>38 (25.5%)</td>
<td>3 (5.8%)</td>
<td>6 (20%)</td>
<td>29 (43.3%)</td>
<td>0.07 &lt; 0.0001</td>
<td>0.0273</td>
</tr>
<tr>
<td>RCA &gt; 70%</td>
<td>80 (53.7%)</td>
<td>17 (32.7%)</td>
<td>15 (50%)</td>
<td>48 (71.6%)</td>
<td>0.12 &lt; 0.0001</td>
<td>0.0389</td>
</tr>
<tr>
<td>Gensini score</td>
<td>14.9 ± 6.7</td>
<td>10.6 ± 4.8</td>
<td>15.2 ± 4.9</td>
<td>18.2 ± 6.9</td>
<td>0.0027 &lt; 0.0001</td>
<td>0.0520</td>
</tr>
<tr>
<td>Peak troponin level [ng/mL]</td>
<td>21.2</td>
<td>11.4</td>
<td>34.7</td>
<td>21.2</td>
<td>0.07</td>
<td>0.65</td>
</tr>
<tr>
<td>Peak CK-MB mass [ng/mL]</td>
<td>76</td>
<td>44.3</td>
<td>109.8</td>
<td>75.4</td>
<td>0.0091</td>
<td>0.51</td>
</tr>
<tr>
<td>Time from symptom onset to PCI [h]</td>
<td>3.3 ± 2.8</td>
<td>3.4 ± 2.5</td>
<td>3.4 ± 2.4</td>
<td>3.2 ± 3.1</td>
<td>0.95</td>
<td>0.72</td>
</tr>
<tr>
<td>Vessel patency</td>
<td>90 (60.4%)</td>
<td>25 (48.1%)</td>
<td>21 (70%)</td>
<td>44 (66.7%)</td>
<td>0.0540</td>
<td>0.0419</td>
</tr>
<tr>
<td>TIMI flow</td>
<td>2.7 ± 0.7</td>
<td>2.8 ± 0.5</td>
<td>2.8 ± 0.4</td>
<td>2.7 ± 0.7</td>
<td>0.96</td>
<td>0.52</td>
</tr>
</tbody>
</table>
DISCUSSION

In our study population, risk factors for CAD were significantly more frequent compared to the general Polish population according to the NATPOL 2002 and 2011 studies: hypertension was present in 65% of patients, and diabetes in 23% of patients. More than 30% of patients were older than 70 years, and 23% of patients had a history of myocardial infarction. Patients with acute STEMI, who are at a higher risk of possible complications, were predominant in our study population (about 70%). As indicated by clinical trials and registries, patients with acute non-STEMI are currently more prevalent among those admitted due to ACS and long-term outcomes are paradoxically worse in this patient subset [12]. According to the Polish PL-ACS registry, including 90,153 patients, the proportion of non-STEMI patients increased from 24% in 2004 to 38% in 2010 (p < 0.0001). At the same time, 12-month mortality decreased significantly from 19.1% to 14.5% [13]. Thus, the result of a coronary intervention is of a major importance. In most ACS patients treated with successful PCI of the IRA, clinical outcomes improve [1, 2, 4], while in cases of failed intervention, incomplete reperfusion, no-reflow syndrome, MVD requiring multiple-stage PCI, the patient clinical condition remains unstable or worsens during long-term follow-up. Clinical indicators include exercise and rest pain, episodes of asymptomatic ischaemia in non-invasive testing, no improvement or worsening of echocardiographic wall motion disturbances, and the occurrence of arrhythmia. These patients require readmissions and invasive coronary angiography [6, 7, 14].

During hospitalisation, complications of infarction occurred in 17 (32.7%) patients with SVD and 54 (55.7%) patients with MVD. Clinical and PCI-related complications were associated with a significant prolongation of the hospital stay which ranged from 8 to 17 days. A relatively high number of cardiovascular events and complications indicates that decreasing the duration of hospital stay without evaluation of the risk of recurrent stenosis or severity of lesions in other vessels may often result in apparent reduction in the number of cardiovascular events during the index hospitalisation but is associated with an increased number of these events during long-term follow-up. Thus, shortening of the hospital stay requires improved in-hospital diagnostic evaluation and/or significant improvement of further outpatient care, with adequate access to necessary follow-up investigations.

In our study group, MVD was diagnosed in more than 60% of cases. This is in agreement with observations of other authors and is associated with worse outcomes [15]. Except for few cases of single-stage PCI of two or 3 coronary vessels in the acute period, most patients were referred for another delayed procedure, which may be related to unfavourable reimbursement in cases where treatment consists of a single procedure during the index hospitalisation. Often, despite the presence of significant lesions in other arteries, patients were not referred for further stages of the invasive treatment due to a high procedural risk and/or adverse coronary anatomy. Published studies indicate an increased rate of both recurrent stenoses in the IRA treated with PCI and rapid progression of other lesions, with increased plaque instability, in MVD patients in whom incomplete revascularisation was achieved. The mechanisms of possible effect of other coronary lesions on more frequent occurrence of restenosis within IRA require further studies. Complex and locally unstable atherosclerotic plaques are responsible for ACS but increasing evidence indicates more rapid progression of previously stable plaques and
their evolution in unstable lesions in other coronary arteries that were not subjected to invasive treatment. Postulated mechanisms indicate the effect of inflammation, increased potential for thrombogenesis, and increased platelet activity [6, 7]. Recurrent IRA stenoses and progression of lesions in other coronary vessels are often asymptomatic, indicating the need for follow-up noninvasive testing [16]. Reports of recurrent ACS within one month after the infarction, associated with a 10% mortality rate, suggest that it is advisable to aim for complete revascularisation already during the index hospitalisation. This is particularly the case for high-risk patients with diabetes, post-infarction left ventricular dysfunction, renal failure, hormonal disturbances, and other concomitant conditions. In these situations, CABG or the hybrid approach of minimally invasive cardiac surgery combined with PCI is more beneficial [6–8, 14, 17].

A high number of cardiovascular events in the study group despite a relatively small patient sample allowed assessment of outcomes in patients with MVD. Adverse outcomes in patients with ACS and MVD and incomplete revascularisation or reduced IRA patency may be affected by the fact that these patients are often not referred for further revascularisation procedures [6]. Our findings may provide another evidence in favour of complete revascularisation in patients with ACS and MVD. This is also supported by clinical trial results [18–20]. On the other hand, some data were also published to indicate equivalent outcomes of both treatment approaches [21, 22]. The recently reported IABP SHOCK II trial showed that complete revascularisation of MVD in patients with STEMI and cardiogenic shock did not result in expected benefits compared to those patients in whom revascularisation was limited to IRA [23]. This has likely been an effect of worse patient clinical condition at baseline (due to concomitant conditions) and anatomic factors related to the necrosis area. The current European Society of Cardiology guidelines on the management of acute STEMI highlight inconclusive evidence on the optimal management strategy regarding revascularisation of the remaining significant coronary lesions in patients who underwent PCI of the IRA [9]. Further studies are currently underway, including the PRAGUE 13 and CROSS AMI trials. In 2013, results of the prematurely terminated randomised PRAMI study were reported, indicating that preventive PCI of other vessels in patients with acute STEMI reduced the risk of cardiac death, recurrent infarction and recurrent ischaemia during follow-up [24], which is consistent with our findings.

**Limitations of the study**

Our single-centre study included a relatively small patient sample which was followed up for 1 year. Upon obtaining patient consent, we included consecutive admitted patients regardless of the ACS type, and the study was not randomised, resulting in the observed proportion between STEMI (70.5%) and non-STEMI (29.5%) in the study population. Due to this distribution of STEMI and non-STEMI patients, direct comparative statistical analyses were inconclusive and did not constitute a major aim of the present study. We assumed that patients received recommended drug therapy (clopidogrel, acetylsalicylic acid, statin, beta-blocker, angiotensin-converting enzyme inhibitor) during the follow-up after hospital discharge. The study material did not include evaluation of coronary lesion severity by other methods (e.g., fractional flow reserve technique).

**CONCLUSIONS**

Despite highly successful interventional treatment, cardiovascular events or other complications occurred in a large number of patients with ACS, both in-hospital and during 1-year follow-up. Residual significant coronary lesions left without intervention were associated with an increased risk of adverse clinical events, including increased all-cause mortality and an increased rate of cardiovascular events and ACS during follow-up. At the same time, single-stage complete revascularisation in patients with ACS and MVD was associated with improved outcomes.

**Conflict of interest:** None declared

**References**


GRANT NAUKOWY SERVIER 2015

1. Podania o finansowanie projektów naukowych w ramach „Grantu Naukowego Servier” mogą składać członkowie Polskiego Towarzystwa Kardiologicznego (PTK) z co najmniej rocznym stażem członkowskim.

2. O finansowanie projektów nie mogą się ubiegać osoby realizujące obecnie „Grant Naukowy Servier” przyznany w latach ubiegłych oraz osoby, które nie rozliczyły grantu przyznawanego wcześniej przez PTK (dotyczy również grantów wyjazdowych).

O grant nie mogą się również ubiegać pracownicy firm farmaceutycznych.

3. Do 15 kwietnia 2015 roku kandydaci mogą zgłaszać swoje aplikacje w formie pisemnej oraz na płycie CD, zawierające niezbędne załączniki:
   — CV wraz z listą osiągnięć naukowych i publikacji (w tym dane dotyczące IF i IH) oraz udokumentowanego doświadczenia w zakresie tematyki projektu, a także potwierdzenie posiadania odpowiedniego zaplecza laboratoryjnego, pracowni diagnostycznych niezbędnych do wykonania projektu (publikacje lub pismo od kierownika kliniki);
   — adres miejsca pracy i nazwisko kierownika ośrodka;
   — opis projektu badawczego zawierający cel naukowy, metodykę badania, spodziewane wyniki, ramy czasowe projektu, koszty procesu ujawniać informację o ewentualnych innych źródłach finansowania.

4. Grant wynosi 150 000 PLN.

5. Czas realizacji grantu obejmuje 24 miesiące.

6. Wnioski o grant naukowy powinny być przesłane na adres siedziby PTK:
   Zarząd Główny PTK
   ul. Stawki 3a, lok. 1
   00–193 Warszawa

Znaczenie rokownicze zakresu rewaskularyzacji u pacjentów z ostrymi zespołami wieńcowymi i wielonaczyniową chorobą wieńcową w rocznej obserwacji prospektywnej

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*Autorzy uczestniczyli w tworzeniu pracy w jednakowym stopniu.

Streszczenie

Wstęp: Leczenie interwencyjne chorych z ostrymi zespołami wieńcowymi (ACS) poprawia rokowanie. Jednak mimo rozwoju metod przezskórnych interwencji wieńcowych (PCI) u osób z wielonaczyniową chorobą wieńcową (MVD) ryzyko wystąpienia dalszych zdarzeń sercowo-naczyniowych jest istotne.

Cel: Celem pracy było określenie znaczenia rokowniczego MVD z uwzględnieniem zakresu rewaskularyzacji u chorych z ACS w średnio rocznej obserwacji prospektywnej.

Metody: Grupę 153 pacjentów z ACS obserwowano w jednym ośrodku kardiologicznym. Analizowano sposoby i wyniki leczenia ACS. Końcowe punkty badania zdefiniowano jako: zgon ze wszystkich przyczyn, zgon z przyczyn sercowych, ponowny ACS oraz złożony punkt końcowy (zgon z przyczyn sercowych i ACS).

Wyniki: W planowanym okresie rocznej obserwacji zmarło 11 (7,2%) chorych, z czego 10 w grupie osób z MVD bez pełnej rewaskularyzacji. Nawrót ACS wystąpił u 18 (12%) pacjentów, w tym u 13 chorych w grupie z MVD bez pełnej rewaskularyzacji. Pozostawienie istotnych zwężenia w tętnicach wieńcowych u chorych z MVD było istotnym czynnikiem ryzyka zgonu ze wszystkich przyczyn oraz złożonego punktu końcowego w porównaniu z pacjentami z MVD poddany pełnej rewaskularyzacji (odpowiednio: p = 0,028; p = 0,046) oraz z osobami z chorobą jednonaczyniową (odpowiednio: p = 0,006; p = 0,003).

Wnioski: Niepełna rewaskularyzacja u pacjentów z ACS i MVD istotnie zwiększała ryzyko zgonu ze wszystkich przyczyn, zgonu sercowo-naczyniowego, nawrotu ACS i ryzyko powikłań. Jednoczesna PCI wszystkich istotnych zmian w tętnicach wieńcowych u pacjentów z MVD skutkowała lepszym rokowaniem.

Słowa kluczowe:estre zespoły wieńcowe, choroba wielonaczyniowa, rewaskularyzacja, rokowanie

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