Risk Factors for Acute Myocardial Infarction During the Postoperative Period of Myocardial Revascularization

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Objective - To identify risk factors for acute myocardial infarction during the postoperative period after myocardial revascularization.

Methods - This was a case-control study paired for sex, age, number, type of graft used, coronary endarterectomy, type of myocardial protection, and use of extracorporeal circulation. We assessed 178 patients (89 patients in each group) undergoing myocardial revascularization, and the following variables were considered: dyslipidemia, systemic hypertension, smoking, diabetes mellitus, previous myocardial revascularization surgery, previous coronary angioplasty, and acute myocardial infarction.

Results - Baseline clinical characteristics did not differ in the groups, except for previous myocardial revascularization surgery, prevalent in the case group (34 patients vs. 12 patients; p = 0.0002). This was the only independent predictor of risk for acute myocardial infarction in the postoperative period, based on a multivariate logistic regression analysis (p=0.0001). Mortality and the time of hospital stay of the case group were significantly higher (19.1% vs. 11.1%; p=0.001 and 15.7 days vs. 10.6 days; p<0.05 respectively) than those of the control.

Conclusion - Only previous myocardial revascularization was an independent predictor of acute myocardial infarction in the postoperative period, based on multivariate logistic regression analysis.

Key-words: acute myocardial infarction, myocardial revascularization, extracorporeal circulation

Atherosclerotic coronary disease, in its chronic and acute presentation, is 1 of the 3 major causes of morbidity and mortality in the world. It is estimated that thousands of people are injured or die due to atherosclerotic coronary disease, in addition to the cost of hospital care with this disease. One treatment of choice for atherosclerotic coronary disease is myocardial revascularization, performed for the first time as an emergency in 1964 by Garret et al,

Methods - From June 1995 to September 2000, 89 patients undergoing myocardial revascularization at the Hospital do Coração, Associação do Sanatório Sírio, experienced acute myocardial infarction in the postoperative period. We performed a retrospective case-control study paired according to the interval between the surgeries (± 6 months between myocardial revascularization of case and control groups), to age (± 5 years), sex, number and types of grafts [example: 1
Results

In the study period, 3,068 patients underwent myocardial revascularization, and 89 (2.9%) evolved to acute myocardial infarction in the postoperative period.

Table I shows the univariate analysis of the possible predictive factors of acute myocardial infarction in the postoperative period. In this group, previous myocardial revascularization was present more frequently (34 vs. 12; p=0.0002).

The mean time of hospital stay was higher in the cases of acute myocardial infarction in the postoperative period, when compared with that in the control cases (15 vs. 10 days; p<0.05, fig. 1). Hospital mortality was also higher among patients who experienced acute myocardial infarction in the postoperative period of myocardial revascularization (19.1% vs. 1.1%; p<0.001, fig. 2).

Table II presents the results of the multivariate analysis according to the multiple logistic regression model. In the multivariate analysis of the possible predictors of acute myocardial infarction in the postoperative period, only previous myocardial revascularization surgery was a strong predictor (odds ratio 5.27; confidence interval from 2.35 to 11.82, p<0.0001).

<table>
<thead>
<tr>
<th>Possible predictor factors of PAMI evaluated</th>
<th>Case group (n = 89)</th>
<th>Control group (n = 89)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyslipidemia</td>
<td>42</td>
<td>52</td>
<td>NS</td>
</tr>
<tr>
<td>Hypertension</td>
<td>24</td>
<td>27</td>
<td>NS</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>58</td>
<td>65</td>
<td>NS</td>
</tr>
<tr>
<td>Smoking</td>
<td>40</td>
<td>33</td>
<td>NS</td>
</tr>
<tr>
<td>Previous acute myocardium infarction</td>
<td>28</td>
<td>23</td>
<td>NS</td>
</tr>
<tr>
<td>Previous angioplasty</td>
<td>15</td>
<td>17</td>
<td>NS</td>
</tr>
<tr>
<td>Previous myocardium revascularization surgery</td>
<td>34</td>
<td>12</td>
<td>p=0.0002</td>
</tr>
</tbody>
</table>

Fig. 1 – Hospital stay.

Fig. 2 – In-hospital mortality.
Discussion

Acute myocardial infarction in the postoperative myocardial revascularization period is a complication that results in worse evolution in a short- and long-term 14-18.

Several studies have reported measures that aim at decreasing the incidence of acute myocardial infarction in the postoperative period, in particular enhancement of myocardial protection techniques, enhancement of surgical technique (for example, use of arterial grafts, of circulatory support (especially intraaortic balloon), and pharmacological advances 19,20.

Several authors 10,18,21,22 have tried to identify risk factors for acute myocardial infarction in the postoperative period. It is accepted that left main coronary trunk lesion, 3-vessel coronary artery disease, ejection fraction lower than 30%, emergency surgery, acute myocardial infarction within less than a week, timing of the clamp release in aortic cross-clamping greater than 100 minutes, acute coronary syndrome without ST segment elevation, and previous surgical myocardial revascularization are factors that increase the risk of acute myocardial infarction in the postoperative period.

In this study, risk incidence and hospital mortality were more elevated in those patients with acute myocardial infarction in the postoperative period (19% vs. 1.1%; p<0.0001), which is in accordance with data from the literature 18,21-23.

Among the variables tested as possible risk factors, only the presence of previous myocardial revascularization was identified as an independent predictor of risk. We have pointed out that the mean time of previous infarction in our group of patients was 24 days, and risk factors for atherosclerotic coronary disease tested (dyslipidemia, smoking, diabetes mellitus, and systemic hypertension) were not predictors of acute myocardial infarction in the postoperative period of myocardial revascularization.

We also observed increased hospital stay in the case group in comparison with that of the control.

Based on these results, we concluded that acute myocardial infarction in the postoperative period after myocardial revascularization surgery results in greater hospital mortality; however, in this study it was a low-incidence complication, and the previous myocardial revascularization was the only predictor of risk.

References

19. Buckberg GD. Strategies and logic of cardioplegic delivery to prevent, avoid


