Unstable Angina Patients Treated with Percutaneous Coronary Intervention in the New Millennium: What Characterizes Them?

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Objective: To identify clinical and angiographic profiles of patients with unstable angina seen at a tertiary hospital and treated with percutaneous coronary intervention (PCI).

Methods: Study of a consecutive series of 1413 patients, selected from a computerized database, who underwent percutaneous revascularization in the three-year period of 2002-2004. There were no inclusion/exclusion criteria.

Results: Systemic arterial hypertension (74%) and hypercholesterolemia (65%) were the classical risk factors for coronary disease most frequently observed. Coronary artery bypass grafting and history of myocardial infarction were found in 24% and 28% of the cases, respectively. The subgroups most commonly treated were the IIB (48%) and IIIB (28%). Clopidogrel was prescribed for 51% of the patients and glycoprotein IIb/IIIa inhibitors, for 7%. Multivessel disease evidenced by coronary angiography was detected in 42% of the cases. Type B2 or C lesions were treated in 64%, 94% of which in native vessels. Restenotic lesions were dilated in 5% of the patients. All interventions were performed using coronary stents, the majority of which (67%) were standard bare-metal stents.

Conclusions: 1) Subgroups IIB and IIIB were the most frequently treated (76%); 2) Clopidogrel was the most prescribed antithrombotic agent (51%); 3) Multivessel coronary artery disease was found in 42% of the cases, most of which were complex target lesions located in native vessels; 4) Coronary stent implantation was the chief dilation technique used.

Key words: Unstable angina, coronary angioplasty.
weight administered immediately before the procedure in order to reach an activated clotting time (ACT) of 250 seconds or more; 2) aspirin (200 mg/day), initiated at least one day prior to the intervention and maintained indefinitely; 3) clopidogrel (loading dose of 300 mg, followed by 75 mg/day) or ticlopidine (500 mg/day), both with at least one day of pretreatment. This association was maintained by a period ranging from 30 days to one year. Glycoprotein IIb/IIIa inhibitors were used at the usual doses, when indicated.

With respect to preprocedural angiographic analysis, lesions with diameter stenosis greater than 50% were considered significant; target lesions were classified according to the American Task-Force proposal. Left ventricular function was evaluated globally by left ventricular ejection fraction analysis (LVEF).

Definitions - 1) residual stenosis less than 50%, in the absence of major complications (death, myocardial infarction or emergency CABG), was considered successful; 2) myocardial infarction was characterized by the presence of new-onset Q-waves on a 12-lead electrocardiogram and/or a rise in CK-MB levels higher than three times the upper limit of normal.

Results
Table 1 shows the primary baseline clinical characteristics. Among the classical risk factor for coronary artery disease, the most commonly observed were systemic arterial hypertension and hypercholesterolemia. Among the diabetic, 233 (57%) were treated with oral hypoglycemic agents 62 (15%) and were insulin-dependent.

According to Braunwald’s classification (Tab. 2), most cases fell into subgroups IIB and IIIB.

As to adjunctive clinical therapy, clopidogrel was prescribed for 51% of the patients and ticlopidine, for 49%, whereas glycoprotein IIb/IIIa inhibitors were administered to 7%. All patients were medicated with aspirin and a thienopyridine.

Left ventricular function was preserved (LVEF > 55%) in most patients (856 - 61%). As for the extension of heart disease, 824 patients (58%) had single-vessel disease, 370 (26%) had two-vessel disease, and 188 (16%) had three-vessel disease. Target lesions of greater complexity (B2 or C) were the most frequently treated (62%); angiographic evidence of intracoronary thrombi was found in 13% of the cases. In the overwhelming majority of patients, dilation was performed in native vessels (94%). Restenotic lesions were treated in 5% of the cases.

Complete revascularization was achieved in 73% of the cases. All patients received endovascular stents, 63% of whom by direct implantation. Drug-eluting stents were used in 33%, most of them (80%) were sirolimus-eluting stents. Multivessel PCI comprised 18% of the cases.

Ninety-six percent of the procedures were successful. Major in-hospital complications included: post-PCI myocardial infarction in 1% and death in 0.1%. No emergency surgeries were required.

Discussion
The marked frequency and significant morbidity and mortality associated with unstable angina have prompted a series of clinical trial in the last decade. These trials concluded that invasive strategy, based on routine and early indication for coronary angiography and myocardial revascularization, yields consistent benefits to patients. In these circumstances, recent clinical trials have demonstrated that PCI accounts for around two-thirds of the revascularizations. Despite this observation, in both Brazilian and international literature, contemporary papers addressing this subject specifically are scant. For example, in the PCI-CURE clinical trial, an exception to this rule, none of the 30 references discusses this subject specifically. In addition, it should be emphasized that the PCI–CURE study itself, is, in fact, a subgroup analysis, rather than a specific larger investigation.

The present study, which assessed 1413 consecutive cases treated with PCI in a single center, demonstrated the following: 1) patients’ mean age range was slightly over 60 years; 2) there was a high prevalence of classical risk factors for coronary disease, particularly hypercholesterolemia and systemic arterial hypertension; 3) approximately one-third of

Table 1 - Baseline clinical characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Males</td>
<td>62%</td>
</tr>
<tr>
<td>Mean age</td>
<td>61 years</td>
</tr>
<tr>
<td>Family history of CHD</td>
<td>53%</td>
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<tr>
<td>Arterial hypertension</td>
<td>74%</td>
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<tr>
<td>Smoking</td>
<td>57%</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>29%</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>65%</td>
</tr>
<tr>
<td>CRF</td>
<td>6%</td>
</tr>
<tr>
<td>Previous CABG</td>
<td>24%</td>
</tr>
<tr>
<td>Previous PCI</td>
<td>29%</td>
</tr>
<tr>
<td>Previous AMI</td>
<td>28%</td>
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</tbody>
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Table 2 - Clinical subgroups, according to Braunwald’s classification.

<table>
<thead>
<tr>
<th>Class</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>13%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>II</td>
<td>-</td>
<td>50%</td>
<td>-</td>
</tr>
<tr>
<td>III</td>
<td>-</td>
<td>37%</td>
<td>-</td>
</tr>
</tbody>
</table>

CAD = coronary artery disease; CRF = chronic renal failure; CABG = coronary artery bypass graft surgery; PCI = percutaneous coronary intervention; AMI = acute myocardial infarction.
the patients had past history of myocardial revascularization; 4) subgroup III of Braunwald’s classification, an isolated inclusion criterion found in all contemporary studies, was diagnosed in one-third of the treated cases.

Table 3 compares our data with that of the main UA clinical trials, including a recently published meta-analysis involving 9212 participants in seven studies, among them FRISC II, TACTICS-TIMI 18 and RITA III. Age and gender were observed in similar manner. However, the presence of classical risk factors for coronary disease and history of percutaneous or surgical revascularization was notably higher in our study. This observation may reflect the distinction between the so-called real world, of which our material is a reflex, and the more strict universe of scientific investigations limited by preestablished inclusion and exclusion criteria. The difference in subgroup III of the Braunwald’s classification, found in 37% of the dilated cases in our Service and contrasting with the 100% reported by all aforesaid studies, is explained by the fact that these clinical trials included only anginal patients seen within the past 24 to 48 hours, unlike our cohort, which included also cases treated in the mentioned period, regardless of subgroup. It is found, therefore, that patients belonging to subgroups I and II of Braunwald’s classification, probably the majority in the real-world setting, were poorly evaluated in recent international literature.

The association of aspirin and thienopyridines was prescribed for all patients not only because of their clinical condition itself, but also because all of them had undergone coronary stenting. The current pretreatment approach, with either clopidogrel or ticlopidine, allowed glycoprotein IIb/IIIa inhibitors to be used in only 7% of the patients, with favorable clinical results in more than 95%. Another fact that may have accounted for the low use of abciximab or tirofiban was that most UA diagnoses indicated Braunwald’s class II, that is to say, cases of relatively less urgency.

With regard to angiographic data, more complex target lesion (B2/C) was prevalent, usually with preserved left ventricular function. This is consistent with previous literature reports, in which significant obstructive atherosclerosis predominates.

Because coronary stents treat these morphological types of stenosis more effectively, safely and predictably than the other dilation devices, they became the treatment of choice when PCI is considered. In this study, all patients were treated with this technique, a figure approaching the 84% reported by the PCI-CURE study. The high success rates and rare major complications of the in-hospital outcomes corroborate this statement. More recently, both in UA and other clinical presentations of coronary disease, drug-eluting stents, used in 33% of the patients in our investigation, yielded significant improvement in late clinical outcome, based on a marked decrease in additional revascularizations secondary to coronary restenosis. Nevertheless, a recent European investigation on the cost-effectiveness of drug-eluting stents demonstrated that UA cases are among those that do not offer significant benefit when used routinely. Of note is that the relatively small percentage of drug-eluting stents used in our study was especially due to the fact that the Sistema Único de Saúde (Brazilian national health care system), the chief financial source of the procedures performed in our hospital, does not authorize the implantation of these devices.

Limitations - This study evaluated a cohort of 1413 patients treated with PCI in a tertiary hospital in the presence of UA. Although it presents a clear profile of these cases, the characteristics observed do not necessarily express the clinical/angiographic profile of all the cases presenting non-ST segment elevation acute coronary syndromes in this kind of institutions. As already stated, similar studies providing a more accurate comparison are scarce. Accordingly, our data were compared with those of larger normative clinical trials, in which only part of the cases were treated with PCI.

Conclusions

This investigations identified the following characteristics in the UA cases evaluated: 1) male patients, with high prevalence of classical risk factors for coronary disease; 2) of the clinical forms of unstable angina presented, subgroups IIb and IIIb of
Braunwald’s classification predominated; 3) thienopyridines were administered to all patients, whereas glycoprotein IIb/IIIa inhibitors were used in 7%; 4) target lesions of greater complexity, located in native vessels, predominated; 5) all patients were treated with coronary stent implantation, one-third of whom with drug-eluting stents.

References