Original Article

Cardiovascular outcomes in patients treated with primary percutaneous coronary intervention in a general tertiary hospital

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ABSTRACT

Background: There are few national data on the results of primary percutaneous coronary intervention (PCI), and registries are a great tool for assessing patient profiles and post-procedure outcomes. The aim of this study was to describe the profile of patients with primary PCI in a general tertiary hospital, as well as to evaluate in-hospital and 30-day cardiovascular outcomes.
Methods: The study included all patients submitted to primary PCI between 2012 and 2015. This was a prospective registry, in which the analyzed clinical outcomes were the occurrence of death, infarction, or stroke, and major cardiovascular and cerebrovascular events (MACCE).
Results: The study included 323 patients, aged 60 ± 12 years, of whom 66.7% were males, 28.5% diabetics. At admission, 13.5% of the patients were classified as Killip class III/IV. The pain-to-door time was 4.4 ± 2.5 hours and the door-to-balloon time was 68.0 ± 34.0 minutes. Hospital mortality was 9.9%, and 18.3% of the patients presented MACCE in 30 days.
Conclusions: Patients submitted to primary PCI had high rates of MACCE, which can be attributed to the more severe clinical presentation and to a long time of ischemia. The faster treatment of these patients, a modifiable variable, demands immediate attention from the health system.

Desfechos cardiovasculares em pacientes tratados com intervenção percutânea coronária primária em hospital geral terciário

RESUMO

Introdução: Existem poucos dados nacionais a respeito dos resultados da intervenção coronária percutânea (ICP) primária, e os registros são uma ótima ferramenta para a avaliação do perfil dos pacientes e dos desfechos pós-procedimento. O objetivo deste estudo foi descrever o perfil dos pacientes com ICP primária em um hospital geral terciário, bem como avaliar os desfechos cardiovasculares hospitalares e em 30 dias.
Métodos: Foram incluídos todos os pacientes submetidos à ICP primária entre 2012 a 2015. Trata-se de um registro prospectivo, no qual os desfechos clínicos analisados foram a ocorrência de morte, infarto ou acidente vascular cerebral, e eventos cardiovasculares e cerebrovasculares maiores (ECCAM).
Resultados: Foram incluídos 323 pacientes, com idade 60 ± 12 anos, sendo 66,7% do sexo masculino, 28,5% diabéticos. Na admissão, 13,5% dos pacientes apresentavam-se em Killip III/IV. O tempo dor-porta foi de 4,4 ± 2,5 horas e o tempo porta-balão foi 68,0 ± 34,0 minutos. A mortalidade hospitalar foi de 9,9%, e 18,3% dos pacientes apresentaram ECCAM em 30 dias.
Conclusões: Os pacientes submetidos à ICP primária apresentaram taxas elevadas de ECCAM, que podem ser atribuídas à apresentação clínica mais grave e a um longo tempo de isquemia. Um atendimento mais rápido destes pacientes, variável modificável, demanda uma atenção imediata do sistema de saúde.

Introduction

Ischemic heart disease is one of the main causes of mortality, with rates of 8.8% in Brazil, having already exceeded cerebrovascular diseases in some states.[1] Of the clinical manifestations of the disease, acute myocardial infarction (AMI) is the one that shows higher mortality, despite the therapeutic advance in the last decades aiming to reduce its impact. In the state of Rio Grande do Sul, Brazil, in 2015, 9,185 hospital admissions for AMI were recorded, of which 2,297 occurred in Porto Alegre, the capital city.[2]

It is known that effective AMI treatment, through early reperfusion therapy, is the most important component of the therapeutic arsenal, being crucial for its clinical outcome, reducing the infarction size, preserving ventricular function, and decreasing morbidity and mortality.[3] Primary percutaneous coronary intervention (PCI) is currently the treatment of choice for ST-segment elevation myocardial infarction (STEMI) and, when compared to thrombolysis, has shown superior results in both mortality reduction and AMI recurrence.[4,5]

There are few data on the results of primary PCI in patients treated by the Unified Health System (SUS, acronym in Portuguese), which, due to limited funding, does not use advanced treatments and is likely to show results that are very different from those seen in clinical trials carried out in developed countries. Additionally, the lack of planning and logistics causes patients to be treated at tertiary referral centers at a very late stage, increasing their morbidity and mortality.

This study aimed to describe the clinical, angiographic, and procedural profile of patients submitted to primary PCI treated at a general tertiary hospital, as well as to evaluate in-hospital and 30-day cardiovascular outcomes.

Methods

Study design and patient selection

This was a prospective registry that included all patients treated with primary PCI in an interventional cardiology unit of a tertiary hospital between 2012 and 2015.

The project was approved by the Institutional Ethics Committee, and the patients signed the Free and Informed Consent Form. The data were recorded prospectively in appropriate forms, stored in electronic spreadsheets, and subsequently collected in a database.

Periprocedural aspects

Patients were pre-treated with 300 mg of acetylsalicylic acid (ASA), a loading dose of 600 mg of clopidogrel, and 70 to 100 IU/kg of intravenous unfractionated heparin. Use of IIb/IIIa glycoprotein inhibitors, aspiration thrombectomy, and percutaneous intervention strategies (pre-dilation, direct stenting, and post-dilation) were performed at the interventionist's discretion. Anticoagulants were discontinued after the procedure (except in cases with absolute indication), and dual antiplatelet therapy, including ASA 100 mg daily and clopidogrel 75 mg daily, was recommended for 12 months after the event.

Study outcomes

The analyzed clinical outcomes were death, stroke, reinfarction, or need for emergency revascularization, isolated or combined. Stent thrombosis, contrast-induced nephropathy (relative increase in basal creatinine ≥ 25% and/or ≥ 0.5 mg/dL 48 to 72 hours post-catheterization),[6] class III or IV heart failure (according to the New York Heart Association – NYHA – classification), and angina class III or IV

(according to the Canadian Cardiovascular Society – CCS – criteria) were also recorded. Clinical follow-up was performed through outpatient consultation or telephone contact.

Angiographic analysis

Coronary angiography was performed using the Axiom Artis equipment (Siemens Healthcare GmbH, Erlagen, Germany). Angiographic analyses were performed by experienced interventional cardiologists, through visual estimation, in at least two orthogonal projections. The initial and final Thrombolysis in Myocardial Infarction (TIMI) flow were determined, and the anatomic complexity was assessed using the SYNTAX angiographic score. To calculate the SYNTAX score, each coronary lesion with luminal obstruction > 50% in vessels ≥ 1.5 mm was scored and, at the end, all lesions were added in accordance with the specified recommendations.

Statistical analysis

Continuous variables were described as mean and standard deviation. Categorical variables were shown as absolute and percentage numbers, and compared using the Chi-squared or Fisher's exact test, as appropriate.

To perform the multivariate analysis, the isolated effect of each variable was initially investigated by simple logistic regression models (univariate analysis). Subsequently, the variables with $p < 0.10$ in the univariate analysis were evaluated simultaneously in a multiple logistic regression model (multivariate analysis). For qualitative independent variables, the reference category was considered that with the lowest frequency of complications. The results were expressed as relative risk (RR) and the respective 95% confidence interval (95% CI).

All data were analyzed using the Statistical Package for Social Science (SPSS) program, version 17.0.

Results

A total of 323 patients submitted to primary PCI performed at Hospital de Clínicas de Porto Alegre from January 2012 to December 2015 were included. The mean age was 60 ± 12 years, 66.7% of the patients were males and 28.5% were diabetics (Table 1).

Patients had a transfer time of 4.4 ± 2.5 hours and door-to-balloon time of 68 ± 34 minutes. The median ischemia time was 5.1 [3.7-6.9] hours. Of the patients included, 74% were referred from other health units, and 29.3% of them were transferred by the Emergency Mobile Service (SAMU, acronym in Portuguese).

Table 1
Clinical characteristics.

Variable	n = 323
Age, years	60 ± 12
Male gender, n (%)	215 (66.7)
White, n (%)	278 (86.2)
Arterial hypertension, n (%)	205 (63.4)
Diabetes mellitus, n (%)	92 (28.5)
Active or previous smoking, n (%)	204 (63.1)
Previous myocardial infarction, n (%)	28 (8.6)
Previous stroke, n (%)	19 (5.9)
Previous use of acetylsalicylic acid, n (%)	68 (21.1)
Creatinine > 2 mg/dL, n (%)	10 (3.1)
Transfer time, hours	4.4 ± 2.5
Door-to-balloon time, minutes	68 ± 34
Prior myocardial infarction, n (%)	126 (39.0)
Cardiorespiratory arrest, n (%)	38 (11.9)
Ejection fraction < 40%, n (%)	51 (15.8)
Killip class III or IV, n (%)	44 (13.5)