



ORIGINAL ARTICLE

Outcomes of drug-eluting stents compared to bare-metal stents in ST-segment elevation acute myocardial infarction

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KEYWORDS

Stents;
Myocardial infarction;
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Abstract

Introduction: Primary percutaneous coronary intervention (PPCI) has become the treatment of choice in patients with ST-segment elevation myocardial infarction (STEMI). Drug-eluting stents (DES) reduce restenosis compared to bare-metal stents (BMS) but there is conflicting data concerning their use in the setting of STEMI. We aimed to evaluate the influence of the type of stent on the outcomes of PPCI.

Methods: This was a single-center longitudinal study including 213 consecutive patients (76% men, mean age 60 ± 12 years) with STEMI undergoing PPCI between 2003 and 2007, divided into two groups: BMS (43.7%) and DES (56.3%). We assessed clinical and demographic features as well as angiographic and electrocardiographic signs of myocardial reperfusion. The composite outcome of death, myocardial infarction (MI) or target-lesion revascularization (TLR) was evaluated.

Results: At a median follow-up of 26 months there were no differences in the composite outcome of death/MI/TLR (BMS 18.3% vs DES 15.8%) or in the incidence of stent thrombosis. Angiographic results of the procedure were also similar. Independent predictors of the composite outcome were age (HR=1.06, 95% CI [1.02-1.11], left anterior descending artery as infarct-related vessel (HR=2.69, 95% CI [1.17-6.19]) and use of glycoprotein IIb/IIIa inhibitors (HR=0.33, 95% CI [0.13-0.83]).

Conclusions: There was no benefit in angiographic outcomes or major cardiac events after treatment with drug-eluting stents compared to bare-metal stents in this group of patients with STEMI.

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PALAVRAS-CHAVE

Stents;
 Enfarte do miocárdio;
 Intervenção coronária
 percutânea;
 Doença coronária/
 terapêutica

Comparação entre *stents* revestidos e não revestidos por fármaco no enfarte agudo do miocárdio com supradesnivelamento de ST

Resumo

Introdução: A angioplastia primária (ICPP) é o tratamento de eleição para enfarte agudo do miocárdio com elevação de ST (EAM ST). Os *stents* farmacológicos (DES) permitem reduzir a taxa de restenose coronária, sendo controverso o seu uso no contexto de EAM ST. O objectivo deste estudo foi avaliar os resultados clínicos da ICPP em função do tipo de *stent* usado (não revestido versus DES).

População e métodos: Estudo longitudinal de centro único, incluindo 213 doentes consecutivos, idade média 60 ± 12 anos, 76% homens, submetidos a ICPP no contexto de EAM ST, entre 2003 e Novembro 2007. Foram considerados 2 grupos: *stent* não revestidos (BMS) (43,7%) e DES (56,3%). Analisaram-se as características clínicas e demográficas dos 2 grupos, comparando-se também variáveis angiográficas, de perfusão miocárdica, grau de resolução de segmento ST pós-ICPP e pico de troponina. Determinou-se no seguimento a incidência do evento combinado: morte, enfarte do miocárdio (EAM) ou revascularização de lesão alvo (TLR).

Resultados: No seguimento mediano de 26 meses não se encontraram diferenças no evento combinado Morte/EAM/TLR (BMS 18,3% versus 15,8%) nem na trombose de *stent*. Os resultados angiográficos foram também semelhantes. Os preditores independentes de morte/EAM/TLR foram a frequência cardíaca (HR = 1.06 95% IC [1.02-1.11], descendente anterior como vaso *culprit* (HR = 2.69 95% IC [1.17-6.19]) e utilização de inibidores da glicoproteína IIb/IIIa (HR = 0.33 95% IC [0.13-0.83]).

Conclusão: O tipo de *stent* utilizado não parece ter influência na ocorrência de eventos cardíacos em doentes submetidos a angioplastia primária, no contexto de EAM ST.

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Introduction

The use of stents in primary and rescue percutaneous coronary intervention (PCI) is superior to balloon angioplasty, with lower rates of repeat revascularization and lower mortality^{1,2}. Drug-eluting stents (DES) have been shown to be safe and more effective than bare-metal stents (BMS) in reducing restenosis and the frequency of repeat interventions in patients undergoing elective PCI^{3,4}. However, there are conflicting results regarding the efficacy of DES as compared to BMS in the setting of primary PCI for ST-elevation acute myocardial infarction (STEMI). In particular, late stent thrombosis due to delayed endothelialization and malapposition after DES implantation raises safety concerns, since there are studies suggesting that DES are associated with an increased rate of this event compared to BMS^{5,6}.

The aim of this study was to compare the clinical outcomes of patients presenting with STEMI treated with DES or BMS as part of primary PCI.

Methods**Study design and data collection**

This was a single-center, longitudinal, observational study which included 213 patients treated with primary PCI for STEMI between January 2003 and November 2007. Of these, 93 were treated only with BMS and 120 were treated only with DES. All data were collected prospectively by the study investigators. Procedural data, including adjunctive

pharmacology, device utilization, reference vessel diameter, pre- and post-procedural TIMI flow, lesion length and lesion characteristics were assessed by the operating interventional cardiologist.

All the angiography films were reviewed to assess the following variables: pre- and post-procedural TIMI frame count, thrombus grade and myocardial blush grade at the end of the procedure.

The electrocardiograms on admission and after the procedure were also reviewed to evaluate the degree of ST-segment resolution. Peak troponin I and CK-MB were recorded.

Patients were prospectively followed for the occurrence of major adverse cardiac events (defined as a composite of all-cause death, non-fatal myocardial infarction [MI] or target lesion revascularization [TLR]).

Post-discharge clinical follow-up was conducted by telephone interview. All data were entered into a centralized database (CardioBase®).

Definitions

Reinfarction was defined as a clinical event with any new elevation of troponin I or creatine kinase-MB above the upper reference limit and included both ST- and non ST-elevation myocardial infarction. Target vessel and target lesion revascularization were defined as any revascularization procedure of the target vessel or target lesion (from 5 mm distally to the stent up to 5 mm proximally to the stent), respectively. Stent thrombosis was classified as

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