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ORIGINAL

Impact of intra-aortic balloon pump on short-term clinical outcomes in ST-elevation myocardial infarction complicated by cardiogenic shock: A ''real life'' single center experience

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KEYWORDS
Intra-aortic balloon pump;
ST-elevation myocardial infarction;
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Abstract
Objective: To analyze the use and impact of the intra-aortic balloon pump (IABP) upon the 30-day mortality rate and short-term clinical outcome of non-selected patients with ST-elevation acute myocardial infarction (acute STEMI) complicated by cardiogenic shock (CS).
Design: A single-center retrospective case–control study was carried out.
Setting: Coronary Care Unit.
Patients: Data were collected from 825 consecutive patients with acute STEMI admitted to a Coronary Care Unit from January 2009 to August 2015. Seventy-three patients with CS upon admission subjected to emergency percutaneous coronary intervention (PCI) were finally included in the analysis and were stratified according to IABP use (44 patients receiving IABP).
Variables: Cardiovascular history, hemodynamic situation upon admission, angiographic and procedural characteristics, and variables derived from admission to the Coronary Care Unit.
Results: Cumulative 30-day mortality was similar in the patients subjected to IABP and in those who received conventional medical therapy only (29.5% and 27.6%, respectively; HR with IABP 1.10, 95% CI 0.38–3.11; $p = 0.85$). Similarly, no significant differences were found in terms of the short-term clinical outcome between the groups: time on mechanical ventilation, days to hemodynamic stabilization, vasoactive drug requirements and stay in the Coronary Care Unit. Poorer renal function (HR 3.9, 95% CI 1.4–10.6; $p = 0.008$), known peripheral artery disease (HR 3.3, 95% CI 1.2–9.1; $p = 0.019$) and a history of diabetes mellitus (HR 3.2, 95% CI 1.2–8.1; $p = 0.018$) were the only variables independently associated to increased 30-day mortality.

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Conclusion: In our ''real life'' experience, IABP does not modify 30-day mortality or the short-term clinical outcome in patients presenting STEMI complicated with CS and subjected to emergency percutaneous coronary revascularization.

PALABRAS CLAVE
Balón de contrapulsación intra-aórtico;
Infarto agudo de miocardio con elevación del segmento ST;
Shock cardiogénico

Impacto del balón de contrapulsación intraaórtico en el pronóstico clínico a corto plazo de pacientes con infarto agudo de miocardio con elevación del segmento ST complicado con shock cardiogénico: experiencia de «vida real»

Resumen
Objetivo: Analizar el uso e impacto del balón de contrapulsación intraaórtico (BCIA) en la mortalidad a 30 días y en los desenlaces clínicos a corto plazo de pacientes con infarto agudo de miocardio con elevación del segmento ST complicado con shock cardiogénico.
Diseño: Estudio de casos y controles unicéntrico y retrospectivo.
Ámbito: Unidad Coronaria.
Pacientes: Los datos fueron obtenidos de 825 pacientes consecutivos admitidos en una unidad coronaria con diagnóstico de infarto agudo de miocardio con elevación del segmento ST desde enero de 2009 hasta agosto de 2015. Un total de 73 pacientes en situación de shock cardiogénico al ingreso derivados a una revascularización coronaria percutánea urgente fueron incluidos para el análisis y estratificados en función de la utilización del BCIA (44 pacientes recibieron BCIA).
Variables: Antecedentes cardiológicos, situación hemodinámica al ingreso, características angiográficas y periprocedimiento, y variables derivadas de la estancia en la Unidad Coronaria.
Resultados: La mortalidad a 30 días fue similar entre los tratados con BCIA y aquellos con tratamiento convencional (29,5 y 27,6%, respectivamente; HR con BCIA 1,10, IC 95% 0,38-3,11; p = 0,85). Así mismo, no encontramos diferencias significativas con respecto a los desenlaces clínicos a corto plazo: días en ventilación mecánica, tiempo hasta la estabilidad hemodinámica, requerimiento de fármacos vasoactivos y días de estancia en la Unidad Coronaria. En el análisis multivariante, las únicas variables asociadas de forma independiente con una mayor mortalidad a 30 días fueron peor función renal al ingreso (HR 3,9, IC 95% 1,4-10,6; p = 0,008), antecedentes de enfermedad arterial periférica (HR 3,3, IC 95% 1,2-9,1; p = 0,019) y diabetes mellitus (HR 3,2, IC 95% 1,2-8,1; p = 0,018).
Conclusión: En nuestra experiencia de la «vida real», la utilización del BCIA no modifica la mortalidad a 30 días ni los desenlaces clínicos a corto plazo en pacientes con infarto agudo de miocardio con elevación del segmento ST complicado con shock cardiogénico que son derivados a una estrategia de revascularización coronaria percutánea urgente.

Introduction

Despite advances in primary angioplasty programs, coronary revascularization techniques and medical treatment, cardiogenic shock (CS) complicating acute myocardial infarction still occurs in the range from 5 to 15% and remains the leading cause of hospital mortality associated with ST-segment elevation myocardial infarction (STEMI).[1–4] In this clinical setting, since 1968[5] intra-aortic balloon counterpulsation (IABP) has been the most widely used method for temporary mechanical circulatory support with implantation rates from 2007 to 2011 of 50,000 per year based on a national survey in the USA.[6] Nevertheless, evidence supporting the benefit was based on registries with conflicting results.[7]

The most recent large randomized trial on the use of IABP in patients with myocardial infarction complicated with CS undergoing early revascularization (IABP-SHOCK II trial),[8] showed neither benefit on 30-day mortality nor on any of the secondary endpoints. These results, in addition to the previous limited IABP evidence, led to downgrade the recommendation supporting routine use of IABP in CS in the setting of STEMI from Class IIb B from 2012 ESC guidelines[9] to III A in 2014 myocardial revascularization guidelines.[10]

The aim of our study was to assess the impact of IABP in unselected patients presenting with STEMI complicated with CS undergoing percutaneous coronary intervention (PCI). We aimed to determine if IABP implantation could influence 30-day survival and short-term clinical outcomes during coronary care unit admission.

Patients and methods

Patient population

All patients admitted to our tertiary referral hospital for an urgent PCI with diagnosis of STEMI complicated with CS