

addition to those variables already entered in the model shown in the original manuscript. Importantly, in that model, the low educational level (illiterate or primary) remained independently associated with higher mortality (hazard ratio = 1.16, 95% confidence interval, 1.02–1.34; $P = .03$). Furthermore, the use of aldosterone antagonists was inversely associated with mortality (hazard ratio = 0.74, 95% confidence interval, 0.57–0.96; $P = .02$).

In conclusion, our study shows that a higher educational level, as a marker of higher socioeconomic status, is associated with a more favorable prognosis for long-term mortality after acute myocardial infarction, even after a carefully adjusted multivariable model. The above-mentioned analyses further support our previously reported findings.

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Beta-blocker Use After an Acute Coronary Syndrome. Which one, in Whom, and for How Long?



Tras un síndrome coronario agudo, ¿qué bloqueador beta se debería dar, a quién y cuánto tiempo?

To the Editor,

Having read the article by Raposeiras-Roubín et al,¹ we feel that it warrants a number of considerations, since beta-blockers (BB) are the only drugs used in optimal medical therapy following acute coronary syndrome (ACS) that are currently being questioned. In their analysis of the long-term effect of BB therapy on ACS patients with an ejection fraction > 50% at discharge, a subgroup of patients without a clear indication for this treatment, the authors found a 36% reduction in 5-year mortality.

At present, 3 points are considered to be central to BB therapy following ACS. Firstly, although the use of BB has increased exponentially over the past decade,^{2,3} a recent meta-analysis shows that, in the reperfusion era, no benefit is observed with BB therapy after ACS.⁴ Secondly, the guidelines for secondary prevention issued by the American Heart Association and the American College of Cardiology⁵ recommend the use of only those BB—carvedilol, metoprolol, and bisoprolol—that have been shown to improve survival after ACS; moreover, they recommend a treatment duration of at least 3 years, and acknowledge that it seems logical to prolong their use indefinitely, although there is no available evidence in this regard. Thirdly, as these agents do not appear to provide any benefit in terms of prognosis or recurrence of major cardiovascular complications in patients with stable chronic ischemic heart disease,⁶ the appropriate duration of the treatment is unknown.

In the DIOCLES registry,³ 81% of the patients received BB at discharge, more than 20% more than in the MASCARA registry (67.8%).⁷ During the interval between these 2 registries, there was also an increase in the frequency of revascularization, from 63%⁶ to 85%.² However, in the study by Raposeiras-Roubín et al,¹ the rate of interventional procedures did not exceed 70%, possibly because

it includes patients admitted as long ago as 2003, corresponding to a period prior to the MASCARA registry.⁷ On the other hand, none of the publications mention which BB were administered. For the first time, the 2011 guidelines for secondary prevention of the American Heart Association and the American College of Cardiology included the recommendation that only those agents that have been found to improve survival be administered, given that some of them have not been studied in the post-ACS context or have not even been shown to have any beneficial effect, as is the case of atenolol.⁵ A Spanish registry of patients with chronic ischemic heart disease revealed that precisely those drugs recommended by the American Heart Association and the American College of Cardiology are associated with good resting heart rate control,⁸ a finding that has been directly correlated with an improved prognosis.

Thus, we consider that the article provides solid and clinically relevant evidence regarding the use of BB in patients with ACS, although, in our setting, there continues to be an important lack of knowledge as to which BB should be administered to which patients and for how long after ACS.

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Beta-blocker Use After an Acute Coronary Syndrome. Which one, in Whom, and for How Long? Response



Tras un síndrome coronario agudo, ¿qué bloqueador beta se debería dar, a quién y cuánto tiempo? Respuesta

To the Editor,

We would like to thank Cordero et al. for their comments, because they communicated certain doubts about the compactness of our work,¹ offering the opportunity to clarify them now.

Firstly, the context of stable coronary artery disease is different from acute coronary syndrome. Although they are 2 different stages of the same disease, the clinical and therapeutic implications are different, and therefore the results from one setting cannot be generalised to the other.

Secondly, in the setting of acute coronary syndrome, the time when beta-blockers are introduced and their route of administration must be differentiated. The use of intravenous beta-blockers in the hyperacute phase is a matter of question, particularly for patients with haemodynamic instability. Therefore the meta-analysis² referred to in the letter from Cordero et al. must be interpreted with caution, because while it is true that no mortality benefit was found with beta-blockers, this was based on a meta-analysis in which more than 90% of patients were from the COMMIT clinical trial (effect of intravenous metoprolol in the early phase).

Thirdly, based on recent evidence from the era of percutaneous coronary intervention, with the exception of the data from the J-Cypher registry in less than 1000 patients,³ other clinical trials that evaluated the prescription of oral beta blockers on discharge from hospital after acute coronary syndrome have demonstrated a prognostic benefit in total mortality with this medication, including in the subgroup of patients with preserved left ventricular systolic function.^{4–8}

Lastly, we must correct a small error in the cited rate of intervention from the DIOCLES registry⁹: far from the 81% that Cordero et al. referred to, it was 65.6% (60.7% percutaneous coronary intervention and 4.9% aortocoronary revascularisation surgery), figures which are even lower than the CardioCHUS registry (69.7% percutaneous coronary intervention and 4.6% aortocoronary revascularisation surgery), which, if anything, reinforces our results even more.

Therefore, we communicate our defence of the use, unless contraindicated, of oral beta-blockers (in particular carvedilol, bisoprolol, and metoprolol) after acute coronary syndrome in all patients, including those with preserved left ventricular systolic

function, knowing that in this group the evidence is limited to observational studies and propensity score analysis.

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