Letters to the Editor

Does Educational Level Predict Mortality After Myocardial Infarction Independently of Left Ventricular Function and Medical Treatment?

¿El nivel de estudios predice la mortalidad tras un infarto de miocardio de manera independiente de la función ventricular izquierda y del tratamiento médico?

To the Editor,

I read the article by Consuegra-Sánchez et al[1] with great interest. In their study, the authors report an inverse and independent relationship between educational level and long-term mortality in post-myocardial infarction patients. I would like to make a few points about the methodology and results of the article.[1] In their study, the authors report the mean left ventricular ejection fraction (LVEF) of all patients and indicate LVEF as a predictor of long-term mortality. However, there are no data about the mean LVEF for each group. It is known that LVEF $< 40\%$ is an independent predictor of mortality after myocardial infarction.[2] Therefore, the authors should state the mean LVEF and incidence of patients with LVEF $< 40\%$ for each group and compare the mean LVEF among the groups. A higher incidence of patients with LVEF $< 40\%$ in illiterate and primary education patient groups may be another significant reason for higher mortality rates. Additionally, the study by Consuegra-Sánchez et al[1] includes patients with impaired left ventricle systolic function (mean LVEF = 49% for all patients). Aldosterone antagonists significantly reduce all-cause mortality in post-myocardial infarction patients with LVEF $< 40\%$, in addition to standard medical therapy.[3] In the study by Consuegra-Sánchez et al,[1] there are no data on the incidence of patients treated with aldosterone antogonists. A higher incidence of treatment with aldosterone antagonists in secondary education and higher education patient groups may be the reason for lower mortality rates.

In conclusion, low educational levels may be associated with adverse outcomes in post-myocardial infarction patients. However, LVEF and aldosterone antagonists may still have an effect on the results of the study by Consuegra-Sánchez et al.[1] To indicate low levels of education as a predictor of mortality, it should be proven that there were no differences in the mean LVEF of all patient groups and that all patient groups were treated similarly with all medications that are known to reduce mortality in post-myocardial infarction patients.

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Available online 11 September 2015

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Does Education Level Predict Mortality After Myocardial Infarction Independently of Left Ventricular Function and Medical Treatment? Response

¿El nivel de estudios predice la mortalidad tras un infarto de miocardio de manera independiente de la función ventricular izquierda y del tratamiento médico? Respuesta

To the Editor,

We certainly agree with Dr. Eyuboglu that left ventricular ejection fraction (LVEF) is a major determinant of outcome in patients with acute myocardial infarction. The author of the letter questions whether the independent association observed in our study[1] between low educational level and outcome might be confounded by a different LVEF across the educational levels. Indeed, we observed an ascending gradient between educational levels and LVEF: illiterate 47% ± 10%, primary education 48% ± 11%, secondary education 50% ± 10% and university 50% ± 10% (P for trend = .004). However, as indicated in Table 5 of the original manuscript,[1] LVEF was entered in the multivariable model thus virtually rejecting the hypothesis suggested by Dr. Eyuboglu. Furthermore, when interaction analyses were performed in patients with and without depressed LVEF, the association between educational level and outcome remained virtually unchanged.10.1016/j.recesp.2015.07.014

The in-hospital prescription of aldosterone antagonists was globally low in our study cohort (n = 141, 2.4%). They were mainly prescribed to illiterate patients (16, 3.9%). To satisfy this reader's concern we have performed a new multivariable analysis considering aldosterone antagonists as a new covariate in

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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Available online 29 September 2015

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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 Cardiology[5] 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 Rasposeiras-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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Available online 15 September 2015

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