DIOCLES: Some Caveats and New Questions. Response

DIOCLES: algunos matizes y nuevas preguntas. Respuesta

To the Editor,

On behalf of the Scientific Committee and researchers of the DIOCLES registry,1 we wish to thank Rosell-Ortiz et al for their letter and their interest in our study. The results are certainly promising in that they show a decrease in the in-hospital and 6-month mortality rates among patients with acute coronary syndrome (ACS) with respect to that recorded in the MASCARA study, the most recent large registry carried out in Spain,2 and are in accordance with the progressive reduction in mortality due to ST-segment elevation acute myocardial infarction (STEMI) observed over the past 20 years. Undoubtedly, a number of factors have influenced this reduction, and the development of out-of-hospital emergency services is probably not the least important of them. Closely related to the latter aspect is the progressive incorporation of protocol-based networks for the management of patients with STEMI, in which prehospital care plays a major role.4,5 We agree with the authors of the letter in that the overall mortality occurring during the acute phase of STEMI is higher than the 6.6% recorded in our study,1 as this value does not take into account prehospital mortality, both to ensure coherence for comparison with previous registries2,3 and because it is very difficult to reliably estimate its incidence.

We did not examine the possible differences in mortality in the overall group of ACS patients or specifically in those who also had STEMI in terms of the level of care provided by hospitals or the Spanish autonomous community, aspects of unquestionable interest.6 We will attempt to analyze the data from the DIOCLES registry in this respect, but the relatively small size of the population, especially in the subgroup with STEMI, will probably make it impossible to draw firm conclusions. In this subgroup, the overall management strategy applied is almost certainly more relevant than the technological level of the treatment hospital. Extensive evidence indicates that the development of efficient regional networks to care for patients with STEMI, and that include both primary percutaneous coronary intervention and a pharmacoinvasive strategy when this intervention cannot be performed promptly, improves the percentage of reperfused patients and decreases infarction-related mortality. It was not our objective (nor is the sample size large enough) to compare the mortality rate of the patients initially treated with thrombolysis with that of those whose initial treatment was primary percutaneous coronary intervention. In any case, the results of the DIOCLES registry show that, in Spain, there is margin for improvement in the application of both reperfusion strategies.7 As is logical, care provided by an out-of-hospital emergency service was associated with a more frequent use of prehospital thrombolysis (48%), especially if the treatment was administered in a fully-equipped ambulance (56%). However, even in this setting, a significant number of patients underwent thrombolysis in the hospital.

The DIOCLES data coincide with those of previous studies2 in that the patients with unclassified ACS constitute the subgroup at highest risk, and we consider the attempt to identify the determinants of this greater risk, especially the modifiable factors, to be highly relevant. We appreciate the proposal of Rosell-Ortiz et al to carry out an in-depth analysis of the data in this respect.

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Comments on Exercise Echocardiography and Multidetector Computed Tomography for the Evaluation of Acute Chest Pain

Comentarios a la evaluación del dolor torácico agudo mediante ecocardiografía de ejercicio y tomografía computarizada multidetectores

To the Editor,

I have read the article published by the group at the Hospital Clínic de Barcelona1 with great interest, and would like to congratulate the authors publically on their outstanding research endeavor.

Nonetheless, although the authors recommend “a balanced strategy” combining both techniques, in my reading of the article I detect an underlying conflict between them, and would like to make some comments related to this. These comments are intended in no way to diminish the authors’ extraordinary work, but rather to present “the current value” of computed tomography (CT).

1. A limitation not mentioned by the authors is the long time elapsed between the conduct of the study and its publication. It may be that the intervening 6 years have brought no changes in exercise echocardiography and that older results thus remain applicable in 2014; however, developments in multidetector computed tomography (MDCT) during this period have been truly spectacular and exponential. Besides improved spatial and
temporal resolution and reduced radiation doses, these develop-
ments include the introduction of complementary explorations
for the detection of ischemia (perfusion, noninvasive determina-
tion of functional repercussion of stenosis, etc.). These advances
have made MDCT one of the most sensitive and specific methods
for ruling out significant coronary artery disease, second only
to invasive coronary angiography. The noninvasive nature of MDCT
moreover brings added benefits, including the detection of
subclinical coronary artery disease,\(^2\) the potential to characterize
high-risk plaques, and prognostic value.

2. Technical considerations. The diagnostic performance of MDCT
could have been improved with an optimized spatial resolution
of the reconstructions, achievable by modifying the slice
thickness, the between-slice increase and filters as described
by other authors\(^3\) working with exactly the same type of
scanner. Additionally, the mean body surface area
observed in the study population (although the benchmark
parameter in cardiac CT is body-mass index), a tube potential of
100 kV would have improved luminal contrast in the coronary
arteries, thereby facilitating image interpretation and exponen-
tially reduces the radiation dose. Such dose reductions are line
with Society of Cardiovascular Computed Tomography guide-
lines, which recommend the establishment of quality assurance
procedures to meet the following objectives: sufficient diagnos-
tic quality in \(\geq 95\%\) of scans, a demonstrable diagnostic accuracy
at least \(75\%\) that of invasive coronary angiography, and a mean
radiation dose at the reference level (12 mSv according to the
most recent guidelines).\(^4\) Today, with a careful acquisition
protocol and the latest scanners, doses are normally in the
region of 1-2 mSv or even lower, well below the 7-10 mSv in
invasive coronary angiography and the 8-10 mSv in isotope
studies with gamma radiation, demonstrated to be more
harmful than X rays.

3. Methodological considerations. An Agatston score \(>400\) is not
equivalent to the detection of significant coronary artery disease
by MDCT because this threshold drags down the specificity of
the method, with 20% of patients with this score having no
disease.\(^5\) The authors’ statement in the Discussion that “MDCT
has low diagnostic specificity” seems to me to be inappropriate.
What limits specificity is setting the significance threshold at
\(\geq 50\%\) when the “reference pattern” is \(\geq 70\%\) for invasive
coronary angiography (luminogram) and MDCT is based on this
same “luminogram”, with the advantage of assessing the
coronary wall. The \(\geq 50\%\) significance threshold was established
in the cited study by Hoffmann, in which final cost-effectiveness
did not reach statistical significance. In contrast, the Goldstein
study, using a significance threshold of \(\geq 70\%\), showed a
significantly positive cost-effectiveness for MDCT ($2137 for
MDCT compared with $3458 for standard; \(P < .0001\)).

The major scientific societies now accept the diagnostic value of
both techniques and their complementary nature, especially in
non-diagnostic MDCT studies and studies that indirectly evaluate
the functional repercussion of intermediate or limiting stenosis,
an evaluation achieved directly with pressure guides in invasive
coronary angiography.

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Comments on Exercise Echocardiography
and Multidetector Computed Tomography
for the Evaluation of Acute Chest Pain. Response

Comentarios a la evaluación del dolor torácico agudo mediante
eccardiografía de ejercicio y tomografía computarizada
multidetectores. Respuesta

To the Editor,

We would like to thank Dr Catalán for her comments and to
clarify certain points.

Although major technological progress has been made in
cardiac multidetector computed tomography (MDCT) since
2008 when the above-mentioned study was started, it is important
to recognize that both the myocardial perfusion study and the
recent evaluation of functional repercussion using MDCT discussed
by Dr Catalán are emerging techniques that are not included in
clinical practice guidelines.\(^1\) Noninvasive estimation of the
coronary reserve flow using MDCT, whose analysis is still not
widely available, could be promising in the future, but its
diagnostic value in addition to MDCT angiography is still to be
determined for acute chest pain.

Dr Catalán states that the results could have been improved by a
different image reconstruction according to the study by Rixe et al.\(^2\) The device used in our study provides a rotation time
of 370 ms, inferior to the 330 ms used by Rixe et al. To compensate
for the loss of sharpness of the coronary lumen, we used 0.7 mm
slices and 0.4 mm increments instead of the 0.6 \(\times\) 0.3 mm
suggested by Rixe et al, resulting from the tests performed and
consensus among 3 observers. For the same reasons, a tube current
of 120 kV was maintained, similar to that used by Rixe et al, instead
of the suggested 100 kV.

Our article acknowledges the specificity of MDCT was affected
by the 50% stenosis cut-off value, which is why we conducted
another analysis at 70%, producing a considerable improvement in

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