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 ecocardiografía 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. 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. 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 × 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
specificity. However, we did not think that an Agatston Ca score > 400 significantly impaired the specificity of MDCT, as only 1 in 5 patients with a Ca score > 400 did not show acute coronary syndrome. With similar devices, in the presence of a Ca score > 400, the proportion of nonconclusive studies increases, luminal stenosis is overestimated and the specificity of the technique is severely limited; moreover, a Ca score of > 400 has been shown to be an excellent predictor for significant coronary disease. Along the same lines, Goldstein et al. recommended performing single-photon emission computed tomography (SPECT) when Ca scores were > 100, markedly lower than the 400 score used in our study.

Finally, in our opinion, the cost-effectiveness differences between the studies by Hoffman et al. and Goldstein et al. were not exclusively due to the differences in the cut-off values chosen for stenosis (50% vs 70%). Moreover, there were differences in the prevalence of acute coronary syndrome in the MDCT group (9% vs 4.4%), as well as large differences in the percentage of additional tests conducted in the control groups of the 2 studies (45% vs 100%, respectively), which contributed to the discrepancies observed.

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Available online 23 December 2014

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The Genetic Background of Left Ventricular Hypertrabeculation / Noncompaction Remains Vague

El trasfondo genético de la hipertrabeculación/miocardioptía no compactada ventricular izquierda sigue sin estar claro

To the Editor,

We read with interest the article by Rodríguez-Serrano et al about familial left ventricular hypertrabeculation/noncompaction (LVHT) associated with a novel alpha-cardiac actin gene (ACTC1)-mutation in 4 family members (II:4, III:4, III:6, IV:1), of whom 3 (II:4, III:4, III:6) presented with noncompaction and 1 with hypertrabeculation of the explanted heart. We have the following comments and concerns.

We do not agree with the statement that the described ACTC1-mutation “caused” LVHT. LVHT is associated with mutations in a large number of different genes but no proof has ever been provided for any of these associations that a particular mutation is truly causative of this myocardial abnormality. Reservations against a causal relation comes from the following arguments: first, in most cases of hereditary disease in which LVHT has been described, only a limited number of mutation carriers also had LVHT. Second, LVHT may be a dynamic abnormality that may not be present at birth in single patients (acquired LVHT) and may more rarely even disappear during life. Third, most of the few patients with acquired LVHT did not carry a mutated gene and did not have LVHT on previous echocardiographic or other cardiac imaging studies. Fourth, according to the authors themselves, the pathogenicity of the detected ACTC1 variant was neither confirmed nor excluded by in silico analysis. Fifth, the mutated genes so far associated with LVHT are responsible for a variety of hereditary disorders, ranging from cardiac to neuromuscular disease, including hereditary neuropathies and cobalamin-C deficiency. Sixth, LVHT frequently occurs in patients with chromosomal defects (eg, p1.36 syndrome). Given these arguments, we consider LVHT to be a secondary myocardial abnormality in compensation for other cardiac disease, possibly induced by upregulation of regulatory genes. Concerning the index patient, some confusion derives from the description of the explanted heart as having shown LVHT but this is not mentioned in the pedigree. Instead, the authors describe the patient as having “left ventricular hypertrabeculation”. What is the difference between noncompaction and left ventricular hypertrabeculation? In our understanding, noncompaction and hypertrabeculation are 2 different terms for the same entity. The term hypertrabeculation, however, appears to be the more favorable one since it is descriptive and does not imply a causal relation.

Since there is no general agreement on the definition of LVHT, it would be interesting to know if LVHT in the 4 individuals presented would meet Chin’s or Stöllberger’s diagnostic criteria. The echocardiographic image of patient IV:1 is not convincing. Why was LVHT absent on echocardiography? Were the cine loops of this investigation revised? Was LVHT truly absent? If truly absent, what was the reason for the discrepancy with the histologic finding in the explanted heart? Since it is mentioned that this patient had undergone heart transplantation, a picture of the explanted heart would be helpful.

Although involvement of the skeletal muscle in ACTC1-mutations has not been reported, it is advisable to investigate all individuals with LVHT neurologically. This is because neuromuscular disorders...