Detection of High-sensitivity Troponin T in Patients With Cardiovascular Risk. Response

Detección de troponina T ultrasensible en pacientes con riesgo cardiovascular. Respuesta

To the Editor,

We have read with interest the Letter to the Editor by Velilla Moliner et al.[1] concerning our article and appreciate their qualifications.

In contrast to diagnostic methods quantifying high-sensitivity troponin I, the methods used for high-sensitivity troponin T(hs-TnT) allow its detection in about 35% of the healthy population.[2] Without delving into the definition of "healthy" and if the 99th percentile should vary according to the characteristics of the population being studied,[3] this aspect has not undermined the usefulness of hs-TnT in both the diagnosis of acute coronary events and their exclusion (given its high negative predictive value[4]). In addition, as correctly highlighted by the authors, hs-TnT has shown prognostic value not only in heart disease populations, but also healthy populations.

The ideal biomarker would be useful for diagnosis and prognosis, as well as treatment-related aspects. Regarding the latter, hs-TnT is a marker of the effectiveness of the recommended treatment[5] for heart failure.

The findings of the TUSARC (*Troponina T UltraSensible en pacientes de muy Alto Riesgo Cardiovascular* [High-sensitivity troponin T inpatients at high cardiovascular risk]) registry and others obligate clinicians to investigate other causes of hs-TnT elevation beyond ischemia. Thus, the association of an hs-TnT elevation with heart failure and myocardial fibrosis is important[6] because it guides the role of elevated hs-TnT as a marker of both reversible and irreversible structural damage.

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Diagnosis of Cardiac Amyloidosis: Is Imaging Enough?

Diagnóstico de amiloidosis cardiaca. ¿Basta con una imagen?

To the Editor,

We have read with interest the *Image in cardiology* report by García-González et al.,[1] which shows intense uptake of the amyloid tracer ^{18}F-florbetapir on PET/CT (positron emission tomography/computed tomography) in a 75-year-old man with multiple myeloma and heart failure. In the accompanying text, the authors link the positivity of this test with the histological diagnosis of cardiac amyloidosis (CA) and indicate that this test can avoid the risk of cardiac biopsy-related complications.

Without completely dismissing the usefulness of this new imaging test, we believe it important to review some of the fundamental concepts in the clinical treatment of patients with CA:

1. A diagnosis of CA requires histological evidence of amyloid deposits, either in the heart itself or in biopsies from other affected organs.[2] If the biopsy is obtained from an organ other than the heart, the typical signs of CA need to be seen in cardiac imaging tests (echocardiography). False positives are possible in any imaging test, and CA diagnosis frequently has serious prognostic and therapeutic implications.
2. A generic diagnosis of CA is insufficient. The substance deposited needs to be identified because prognosis and treatment vary considerably according to the type of CA.[3] This requires immunohistochemical characterization of the amyloid material found in the biopsy, as well as demonstration of circulating amyloid protein in serum (amyloid light-chain amyloidosis [AL]) or a causative genetic mutation (transthyretin familial amyloidosis).

Physicians can only recommend radical therapeutic options such as transplantation or chemotherapy after identification of the specific type of amyloidosis.[3] The patient studied by García-González et al.[1] does indeed have a high probability of having myeloma-associated AL amyloidosis but, due to his age and sex, might actually have senile CA (due to deposition of wild-type transthyretin), which would involve a different prognosis and therapeutic approach.[4] Only when senile CA is suspected (due to its more benign behavior and the absence of a specific treatment) is it suggested that ^{99m}technetium scintigraphy could obviate the need for endomyocardial biopsy.[5] Nonetheless, the appropriate course of action remains unclear.

In conclusion, we believe that the emergence of ^{18}F-florbetapir PET/CT for the diagnosis of CA is excellent news, especially if it is shown to be more sensitive than the other imaging techniques currently used for this purpose (ultrasound and magnetic resonance),[6] but biopsy of the affected organ is still required. In

general, "blind" biopsies of unaffected tissues (such as abdominal fat and oral or anal mucosa) have less value and can delay diagnosis to a dangerous degree.[7] Only rapid identification of the different subtypes of CA and their specific treatment will improve the bleak prognosis of these patients.

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Diagnosis of Cardiac Amyloidosis: Is Imaging Enough? Response

Diagnóstico de amiloidosis cardiaca. ¿Basta con una imagen? Respuesta

To the Editor,

We would like to thank Segovia Cubero and Segovia Moreno for their interesting comment on our published cardiology image.[1]

First, we should clarify that intense uptake of the amyloid tracer ^{18}F-florbetapir was detected by positron emission computed tomography in our patient. This was accompanied by a typical late gadolinium uptake pattern in the cardiac magnetic resonance imaging and an abdominal fat biopsy positive for Congo red.

As previous articles have indicated, there are no noninvasive tests that can be considered the gold standard for diagnosis.[2] ^{18}F-florbetapir can, however, be useful in different aspects of cardiac amyloidosis. In patients with a strong suspicion of heart disease and intense ^{18}F-florbetapir uptake, a negative endomyocardial biopsy could be interpreted as a false negative and a repeat biopsy could be considered. On the other hand, positron emission computed tomography with ^{18}F-florbetapir enables early detection of heart involvement, for which chemotherapy is indicated to reduce amyloid deposition and its irreversible consequences. The article by Dorbala et al.[3] even indicates that the deposition of the radiotracer may reflect not only the presence of amyloid but could differentiate between light chain and transthyretin amyloid deposition.

In conclusion, we believe that positron emission computed tomography with ^{18}F-florbetapir can allow assessment of cardiac and extracardiac amyloid deposition[4] and improve the diagnosis and management of patients with amyloidosis. As mentioned by the authors, definitive diagnosis of amyloidosis currently requires a histological demonstration of amyloid deposition, whether in the heart or other tissues. Perhaps in the future, after further study, multimodal imaging diagnosis will render biopsy unnecessary.

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