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The CPU-65 Risk Index: Validation and Clinical Value

To the Editor:

In the overloaded situation under which the emergency departments (ED) operate in Spain,[1] the immediate attention that the patient with chest pain (CP) requires constitutes a real challenge. Catheterization of these patients is an essential prerequisite prior to the application of algorithms and indexes that facilitate rapid detection of those who really have an acute coronary syndrome (ACS). Consequently, we have read the article that recently appeared in *Revista Española de Cardiología* (Spanish journal of Cardiology) by Martínez-Sellés et al[2] with great interest. Without going into conceptual

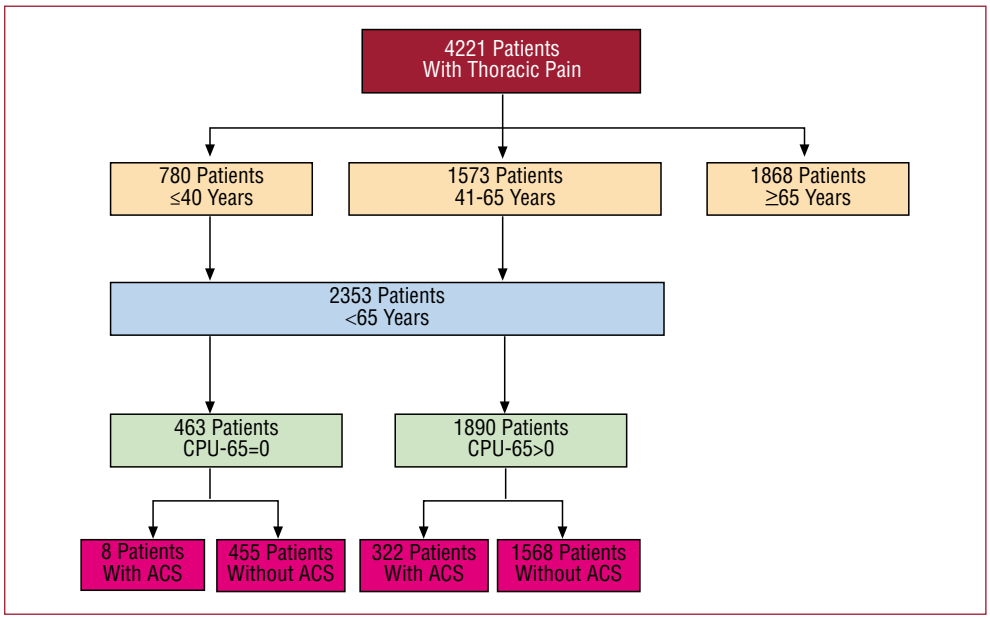

Figure. Simulated application of the CPU-65 index to patients who are seen in the Barcelona Clínic Hospital, Spain, chest pain unit. The distribution by age and by the final diagnosis after follow-up is shown.

considerations of chest pain units (CPU), a coping mechanism in order to offer quality care despite the increased demand,[3] we wanted to emphasise 2 points:

Firstly, the authors leave an article from our group out of their discussion, which also appeared in this journal, where the frequency, clinical profile and final diagnoses of patients who come in to a CPU with non-traumatic CP are described. This leads the authors to conclude, incorrectly, that their study was the first of this type carried out in our country.

Secondly, validation of the CPU-65 index has its limits. Therefore, it is incorrect to conclude that a CPU-65 index =0 is not associated with acute myocardial infarction (AMI) or death, with a negative predictive value for ischaemic heart disease of 99.9%. It is also dangerous to consider troponin measurements to be futile in these patients. Indeed, the study does not provide the percentage of patients with a CPU-65 index =0 who had troponin levels, ischaemia induction tests, hospital admission and, most importantly, there is no follow-up data. The reader, in the end, cannot really know how many patients with CPU-65 =0 had an ACS or not.

Recently, our group proposed an algorithm for classifying patients with CP.[5] Except for a cut-off by age, the variables included coincide with the CPU-65 index: history of ischaemic heart disease (use of aspirin in the CPU-65), diabetes mellitus in both, oppressive retrosternal pain (typical pain in the CPU-65) and age >40 years (>65 years in the CPU-65). Patients with CP with and algorithm =0, that is, absence of all of the risk factors mentioned above, were followed for 1 year and none of them presented ACS. Currently, outside validation is being performed.

With the intent of performing outside validation of the CPU-65 index, avoiding the limitations of the study by Martínez-Sellés et al, we have applied it to our patients with CP that are in our database. This has included 4221 patients, 780 of whom are under 40 years of age, who have undergone follow-up for 1 month. Figure shows the distribution by age and by final diagnosis after follow-up. Of the 463 patients who had a CPU-65 index =0, 8 had acute coronary syndrome, 6 at the first visit to the emergency room and 2 among those under 40 years of age who were followed for 1 month. In particular: 2 cases of unstable angina, 5 AMI without ST elevation, and 1 AMI with ST elevation. None of the patients died. The CPU-65 had a sensitivity of 97.57% and a negative predictive value of 98.27%, with a specificity of 22.49% and a positive predictive value of 17.04%.

In light of these results, we believe, firstly, that these indices still require prospective validation studies to back them up and secondly, in our opinion, they are useful for selecting patients with chest pain in situations, in which the ED is saturated, who can safely wait to be seen, but in no case can they be used to avoid a complete examination and studies that this population at risk, though low, deserves.

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Response

To the Editor:

We would like to thank Sánchez et al for their interest in the article in which we perform outside validation of the CPU-65 index (use of aspirin, diabetes, pain type, 65 years or older)[1] that we have previously described.[2] These authors, after studying 1000 patients, propose an index similar to ours that includes diabetes, pain type (oppressive and retrosternal) and age (>40 years), substituting the use of aspirin with previous coronary artery disease.[3] The authors obtained a sensitivity, specificity, positive predictive value and negative predictive value of 100% for the detection of acute coronary syndrome. However, when using our index in the broadened population of 4221 patients, these parameters change to 98%, 23%, 17%, and 98%, respectively. The only logical explanation for this great discrepancy is that the use of aspirin does not figure in the list of clinical variables collected by these authors.[3] We believe that it is preferable to use the variable "aspirin use" since it is easy to obtain in the history and includes patients with peripheral artery disease. In addition to this, the CPU-65 index is associated with extension of coronary artery disease.[4]

Half of all patients who present to the emergency department with chest pain have a very low risk profile and do not require testing for detection of ischaemia. In daily practice, this is how it is done, though not according to any protocol. For example, in the Sánchez group, 480 (48%) out of 1000 patients with chest pain were initially categorised as "without acute coronary syndrome" and they did not undergo testing to detect ischaemia.[5] In fact, these authors only performed stress testing on 144 patients (14%). The CPU-65 index is useful in detecting patients with a risk that is so low that testing for the detection of ischaemia would be dubious or not cost effective. Indeed, Sekhri et al, studying 4873 patients without previous coronary artery disease who were admitted to chest pain units, have shown that stress testing adds little prognostic value to clinical variables of diabetes, pain type, age, and male gender.[6]

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