Reviewer's report

Title: Sinus Versus Nonsinus Tachycardia in the Emergency Department: Importance of Age and Heart Rate

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Version: 1 Date: 22 Jun 2003

Reviewer: Vassilios P Vassilikos

Level of interest: A paper of considerable general medical or scientific interest

Advice on publication: Unable to decide on acceptance or rejection until the authors have responded to the compulsory revisions

General comments:
The main findings of this study are:
1. The faster the heart rate of the presenting tachycardia, the higher the chance of having NST.
2. This phenomenon is more pronounced as age increases.
This is logical, since infrequently sinus tachycardia exceeds 140bpm, and atrial fibrillation, which was the most commonly observed NS Tachycardia in the study, is the most frequently recorded tachyarrhythmia among elderly patients (Feinberg WM et al. Arch Intern Med 1995 Mar 13;155(5):469-73).
The major limitation of the study, as the authors also note in the discussion, is that in this prediction model the underlying pathology was not taken into account, and therefore the explanation of the findings is limited. I can understand that probably the main idea was to keep the model simple and I agree with this. It would make the paper stronger though, if the patient demographics and underlying pathology (i.e. cardiac/non-cardiac) could be listed, so the results can be explained easier.
Discretionary revisions
Is there a need for a signed consent form for the study?
Compulsory revisions
It is surprising that among 500 ECGs no VT was observed. Is there a reason for this? Over how long period of time the ECG collection was done, and how many ECGs were collected per day?
Is there an explanation why the patients were devided in 349 and 151 for the derivation and the validation groups? (Statistical reason?)
At the results paragraph the SD of age and also gender differences should be included.
At the discussion (3d paragraph, 5th line) I disagree partially with the explanation. The elderly population of this study presenting at the ED have higher chance of NST (rates>141) not because the sinus node is unable to generate rapid rates as a consequence of increased age, but because these patients have more frequently underlying cardiac disease which leads to these rhythms (Afib) compared to the younger individuals. The latter group usually presents at the ED for other than cardiac reasons, and therefore the higher prevalence of sinus tachycardia.
Table 1: n (%) should be moved at the right margin above the data.
Competing interests:

None declared.