Reviewer's report

Title: Intermittent short ECG recording is more effective than 24-hour Holter ECG in detection of arrhythmias

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Reviewer: Nicole Lowres

Reviewer's report:

This is a well-written article that clearly articulates a strategy for increasing the diagnostic yield of atrial fibrillation using a simple and non-expensive screening strategy. I believe it is of interest to the medical profession in general due to the potential for improved stroke prevention from early identification of atrial fibrillation.

I have some minor comments as follows, which are more around improving clarity of the presented text:

MAJOR COMPULSORY REVISIONS - None suggested

MINOR ESSENTIAL REVISIONS

BACKGROUND:
1. A reference is needed to support the statement in the 1st sentence of the 2nd paragraph.

METHODS:
2. Intervention section: Who performed the 24-hour holter recordings and who gave out the handheld ECGs.
3. The handheld device section: Last sentence: Who collected the data for the database.

RESULTS
Atrial fibrillation section
4. Did all 9 patients identified with AF have symptomatic registrations? You present the IQR of 2-9 in table 3, however this may mean that one patient did not have symptoms at all. For a sample of n=9 it may be better to present the entire range within the text.

5. Sentence 5: “These patients had four registrations (median) that showed AF, thus representing 6.6% of registrations.” I am not sure what this refers to, therefore I would suggest re-wording for improved clarity. Does it mean that 4/61 recordings were in AF? And if, from the previous sentence, 9/61 were symptomatic this suggests that 5/61 were symptomatic without any arrhythmia
present.

6. I would suggest reporting the timepoint at which the 9th participant was detected with AF, therefore giving the reader the understanding of how long they would need to record for to pick up these additional cases. It is not clear on which day this occurred from Figure 3 as only the total for all three arrhythmias is presented in this graph (see additional comment on Figure 3) and the discussion section states that only two thirds of all arrhythmias were picked up by day 14.

Atrioventricular-block II section

7. There was one patient with AV-block II not picked up by the handheld device during the 24-hour holter period. This raises the question for me as to why it was not detected. Was it because the arrhythmia was intermittent and not present at the time of the handheld recording (comparing the time-stamps of the readings) or was it that the device was not sensitive enough to detect this?

DISCUSSION

Relevance section

8. The last sentence: “However, the fact that all patients had a CHA2DS2-VASc score # 1” needs further clarification as table 3 states 19 of non AF participants had CHA2DS2-VASc score = 0.

Limitations section

9. Second sentence: I am not sure why this is a limitation of the screening. This is the first time that respiratory sinus bradycardia is discussed in the manuscript. Is it a limitation because it was detected on 24-hour holter monitoring and not on the handheld device? I would suggest that perhaps a sentence regarding “no detection of respiratory sinus bradycardia” should be added to the results section or better still only mentioned there unless the device was not sensitive enough to detect it.

10. There is no mention of the potential effect of the sample size or the generalizability (external validity) of the results in the limitations section as per the STROBE guidelines for reporting of observational studies.

FIGURE 3

11. This graph is confusing. I thought from the text that 2 patients were identified with AF in the first 24 hours however the graph writes n=1 in the first time-point of one day, which does not seem consistent.

DISCRETIONARY REVISIONS

1. METHODS: Design, study population and setting section (lines 9-12). I would suggest using semicolons to improve the distinction of the exclusion criteria:

“eg Exclusion criteria were: known arrhythmia, based on previous history or 12-lead ECG performed at the time of referral; referral for syncope, defined as temporary loss of consciousness; or comorbidity with cognitive or other functional
impairments impeding the use of the handheld device”

2. RESULTS: Demographics section, paragraph three outlines the non-analysable registrations. Were the majority of the non-analysable registrations from the one participant or across a mix of participants? If mainly from one participant you may wish to expand on this.

3. RESULTS: Atrial fibrillation section, sentence 2 and 3 (lines 1-3) are repeated from the previous section. I would suggest re-writing so not repetitive.

4. RESULTS: Atrial fibrillation section, sentence 4 (“Out of a total of 61 intermittent registrations (median) for AF patients only nine (median) were symptomatic (14.8%). (Table 3.) is difficult to understand, therefore I would suggest re-wording for improved clarity. I am not sure if I have understood this correctly, however I suggest something along the lines of: “The nine AF patients performed a median of 61 intermittent registrations of which only nine (median) were symptomatic (14.8%)”

5. RESULTS: Atrial fibrillation section. This paragraph does not state that the AF patients were referred for treatment (and neither does the AV-block section), however you state in the PSVT section that PSVT patients were referred for treatment. I would suggest being consistent with all three arrhythmias and stating what happened for each in the results section, or only stating it as he methodology in the methods section.

6. FIGURE 2: I would suggest separating the two figures so they are better distinguishable from each other and using subheadings to identify the diagnoses, as the computer generated diagnosis is quite small and hard to see amongst all the other information

7. ACKNOWLEDGEMENTS: What role did these nurses assist with?

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare I have no competing interests