Reviewer’s report

Title: Left ventricular non-compaction: clinical features and cardiovascular magnetic resonance imaging

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Reviewer: Claudia Stollberger

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This interesting study describes clinical and ECG characteristics of 42 patients in whom left ventricular noncompaction (NC) was diagnosed by cardiac magnetic resonance imaging (CMRI) and compares the findings with 22 control patients without NC.

To improve its impact, the manuscript should be revised according to the following points:

Major comments

Introduction:

It should be mentioned

- that NC is not only congenital but may develop or even disappear during lifetime,
- that NC is frequently associated with neuromuscular or other inherited disorders,
- how many of the studies about diagnosing NC by CMRI are anatomically controlled by cardiac surgery, heart transplantation or autopsy.

Methods:

- Which echocardiographic machines were used? How was left ventricular systolic function measured echocardiographically?
- According to which criteria were the control patients selected? In the abstract it is mentioned that they were age-matched, however no details are given in the methods.
- In NC planimetry is sometimes difficult or even impossible, due to the ventricular trabeculations, regardless if echocardiography or CMRI is used. How did the authors overcome this problem?
- Were interobserver studies carried out for diagnosis of NC, measurement of EF, x:y ratio and NC area?
- How were abnormal trabeculations, indicative for NC, differentiated by CMRI from papillary muscles, false tendons and aberrant bands?
- Why were the NC patients not investigated neurologically to look for neuromuscular disorders?

Results
• Did the MR machine or the study protocol change during the study period? If yes, did the change of the machine or study protocol influence the prevalence of NC or NC-measurements?
• What was the indication for CMRI in the study patients?
• What was the indication for CMRI in the control patients?
• What was the NYHA class of heart failure in the study patients at the time of CMRI?
• How long was the interval between echocardiography and CMRI?
• Were the echocardiograms re-read after CMRI? In how many patients was NC also visible echocardiographically after having established the diagnosis by CMRI?
• Quantification of NC was carried out at end-diastole. It is known that the duration of diastole is influenced by the heart rate. Thus, it would be interesting to know the heart rate during CMRI and if there was an association with NC-measurements.
• Were any follow-up CMRIs carried out and did NC change qualitatively or quantitatively?

Discussion
• The article by Boyd et al. is referenced in a misleading manner. Boyd studied the anatomical distribution of abnormal trabeculations during autopsy and never stated that 70% of healthy subjects have some degree of NC. Please clarify!
• How to explain that 25 males but only 17 females were diagnosed with NC?
• I agree with the authors that there is little consensus on the diagnostic criteria of NC, especially regarding CMRI. That stresses the need for anatomically controlled studies, as mentioned above. This point should be included in the discussion.

Minor comments
• According to the abstract, 5% suffered from stroke, in the results 4%. Please clarify!
• According to the methods patients were studied over a 6 year period, in the results they were identified over a 4 year period. Please clarify!
• According to results 6 patients were asymptomatic, in table 1 are 5 asymptomatic patients. Please clarify!
• Please correct “routne” in line 1 of the “study limitations”.
• Table 1 – what is “CAF”?

Level of interest: An article of outstanding merit and interest in its field

Quality of written English: Needs some language corrections before being published
**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I have no competing interests.