Reviewer's report:

Title: Can Cardiac Computed Tomography predict cardiovascular events in asymptomatic type-2 diabetics? Results of a long term follow-up

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Reviewer: David A Halon

This is a single centre study of 85 type 2 diabetics without known heart disease referred for CT coronary angiography (CTA) (16 slice) together with coronary artery calcium scoring for risk assessment. Baseline clinical data were recorded prior to CT angiography and follow-up was obtained from the diabetes clinic or hospital records and from a designated study follow-up if required.

Adverse cardiovascular outcomes in type 2 diabetics are widely recognized to be elevated but considerable disparity between patients exists and cardiac CT angiography may have a role to play in stratifying prognosis. The subject of this study is thus of importance and there is limited published information regarding the role of CT angiography in this respect specifically related to diabetics (although data regarding calcium score in diabetics have been published in a few series some years ago, and are quoted in the current manuscript).

The strengths of the study are the reasonably long follow-up period (a median of 48 months) and the follow-up of patients for adverse events other than death or myocardial infarction.

The study has a number of weaknesses. The cohort is small for a study examining outcomes and even when a wide ranging combined primary outcome of cardiovascular death, myocardial infarction, unstable angina, revascularisation (not including that performed immediately after CT), and stroke are included there were only 10 events of which 70% were stroke. The small numbers of events are presumably the cause of this rather spurious distribution of events. If data are available hospitalization for heart failure is an important additional cardiovascular event that might be taken into account.

As the authors contend the study findings indeed seem to show that the addition of CT angiographic data to the clinical risk and calcium scores allows additional discrimination between subjects who will or will not have an outcome event but the small number of events and their spurious distribution need confirmation in a considerably larger cohort to be truly convincing.

Major Compulsory Revisions

1. The authors examine the additional value of CTA findings to those of the clinical risk scores SCORE and Framingham. As I understand it the European risk chart SCORE does not include diabetes mellitus since type 2 diabetics are considered to already be at increased risk and the instructions for its use state it
is not for use in type 2 diabetics. Thus it does not seem to be a reasonable clinical risk assessor for this patient cohort while clinical risk assessors specifically for diabetics exist and would serve as a better comparison (UKPDS and American Diabetes Association).

2. In the Methods section it is stated that CT data were collected regarding calcium score, presence of calcified and non-calcified coronary plaque and luminal stenosis. It is not clearly stated how these were used in a predictive CT score as used in Table 9 and Figure 2.

3. Table 8, as stated in the Statistical Methods, is a multivariate Cox regression with 9 independent variables. With only 10 outcome events it would seem that this is overfitting of the data.

4. In Figure 1 the hazard curves diverge markedly after 40 months. This might be related to a small number of patients remaining in follow-up in one of the cohorts at this time. I suggest adding the number in follow-up in each cohort under the follow-up time or curtailing the graph at 40 months if the numbers are particularly small.

5. Table 9 provides the data for areas under the curves in Figure 2. Although individual curves are significant predictors for an event it is not clear from the Table if there is any statistically significant difference between the curves.

Minor Essential Revisions

1. In the first paragraph of the Results section it is not clear what is implied by a “significant plaque” in relation to other plaques. Is the intention to refer to significant luminal narrowing above a cut-off value?

2. Table 6 is referenced shortly after Table 3 without intervening reference to Tables 4 and 5.

3. In Table 5 the entries for the type of CV events are misplaced upwards by one line.

4. In Table 6 the duration of diabetes follow-up is stated to be in years but is provided in months.

5. In Table 6 the units for CRP are incorrect.

6. I do not understand the legend to Figure 2. Is it the case that the reciprocal of the creatinine clearance (1/clearance) was used? There is at least a problem in the use of English here.

7. In the last sentence of the paragraph on initial data collection SCORE is incorrectly cited to reference 8.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published
**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests