Reviewer's report

Title: Differential association between metabolic syndrome and coronary artery disease evaluated with cardiac computed tomography according to the presence of diabetes in a symptomatic Korean population

Version: 5 Date: 15 May 2014

Reviewer: Thomas B Christophersen

Reviewer's report:

Comment No. 1

Background: The background shortly summarizes the underlying issues the authors wish to elucidate and in paragraph 4 the aim of the study is presented. The paragraph starting “Therefore, we evaluated...” could probably be more presentive of the aim, along the line of “In this study, we aim to evaluate the presence...” in order to more clearly define the aim to the reader. No hypotheses are presented, as this is a descriptive study. (Discretionary Revision)

Comment No. 2

Methods-Study Population: The study was a cross-sectional study of 2,869 consecutive patients at a Single Centre in a defined period of time. The patients had a mixture of symptoms potentially cardiac related: typical angina, atypical angina, dyspnea and fatigue. As some, if not all of these symptoms, may be of different genesis (pulmonary, gastrointestinal), it would be helpful in Table 1 to present relevant co-morbidity or alternately to mention this in the discussion. (Discretionary Revision). Exclusion criteriae are presented, however no actual presentation of the number of referred/screened patients as well as the number of patients being excluded, is reported. If this data is available, then it should be presented. If it is not available, then the three exclusion criteria is not really relevant. What about patients with atrial fibrillation or known allergy to contrast agents? (Major Compulsory Revision).

Comment No. 3

Methods-MDCT protocol and Measurement of coronary parameters: The cardiac CT protocol was well established, starting with a prospectively gated non-contrast scan to evaluated calcium score followed by a contrast enhance scan using retrospective ECG-gating to reconstruct images. Subsequent off-line analyses are well described. The presence of any plaque, presence of any obstructive plaque, and presence of calcium score (using standard Agatston method) was the primary outcome analyzed, secondarily the discrimination between noncalcified and calcified/mixed plaque. The cut-off for calcium score of >100 for severe calcification was justified by ethnic differences. The cardiac scans were evaluated by 2 experienced cardiac radiologists. However, it is not
reported whether or not all scans were evaluated by both readers, independently, and a consensus was reached in case of discrepancies, or the cardiac scans were only described by one of the two available readers. If the later is the case, then some presentation of inter-reader reproducibility should be made in the article. Especially with regards to presence/absence of obstructive disease, but also the presence/absence of non-calcified plaque, this may be problematic (Major Compulsory Revision)

Comment No. 4

Methods-Statistical Analyses: Standard methods using Student t-test for continuous variables. Were the distribution of these variables Normal? Or would a nonparametric test be more appropriate? (Minor Essential Revision). For the binary/categorical variables chi-square is fine. Univariate and multivariate logistical regression were used to analyse the presence/absence of individual components of metabolic syndrome with regards to the presence/absence of coronary artery disease outcomes individually (presence of plaque, presence of obstructive plaque, calciumscore>100). This is a valid analysis and the sample size is sufficient to support the number of covariates. However, the analysis of the number of MeTS-components (with a numerical range of 1-5) cannot be analysed using a standard logistical regression. Was a more complex model, like a proportional odds model used? And how were the model assumptions checked (Major Compulsory Revision). With regards to the stratification of patient with/without diabetes there may be issues of variable independence and confounding. It is unproblematic when analysing individual MeTS-components association to the outcome, but problems may arise when analysing the presence/absence of MeTS with regards to the outcome variables in the stratified analyses in the presence/absence of diabetes as diabetes is both a stratifying variables as well as a part of the definition of the explanatory variable. What about interaction? This also relates to the subsequent presentation of data in Figure 2 and Figure 3 and Table 3 (Major Compulsory Revision)

Comment No. 5

Results: The results are presented in 3 sections of the paper, 3 tables, 3 figures and 1 additional table. There are some discrepancies in the number of patients presented in the tables. The total number of patients was 2,869 (2,308 non-diabetes and 561 diabetes patient). This is presented in table 1. However, in tables 2 and S1 only 2,053 non-diabetic patient and all 561 diabetic patients are included. Please provide the reason for this? (Major Compulsory Revision)

Comment No. 6

Results: Please provide a report of the patient radiation dose in mSv (Minor Essential Revision)

Comment No. 7

Discussion: The discussion is well written and highlights the overall results, discussing them in context to other reports. Generally, the sections about
non-calcified and calcified-mixed plaque are less well described in this report and appear to be a more recent addition? It is less clear in the study aim, why this analysis, specifically, is of interest. Would benefit from clarification. (Discretionary Revision)

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests.