Reviewer's report

Title: Identification of acute myocardial infarction in patients with atrial fibrillation and chest pain with a contemporary sensitive troponin I assay

Version: 1  Date: 30 March 2015

Reviewer: Yoshihiko Seino

Reviewer's report:

Thank you for giving the opportunity of reviewing an interesting manuscript by Liebetrau C et al., which has provided the biomarker criteria for identification of type 1 MI in patients with atrial fibrillation and chest pain by means of troponin I measurements. The present investigation analyzed it in terms of two cohort analysis, the derivation cohort and the validation cohort from their previously reported data, however there need several issues for the revision.

Most important and essential issue should be the validation (diagnostic evidence) of the type 1 AMI (ischemic myocardial necrosis secondary to plaque rupture, ACS) in the present study. Type 2 MI (ischemic myocardial necrosis not due to ACS, due to supply/demand mismatch; such as spasm, embolism, BP lowering, or arrhythmia) would be more prevalent rather than the type 1 MI in patients with atrial fibrillation and chest pain as stated in the 2014 universal definition of MI. Such condition would occur in patients with new onset (or paroxysmal) atrial fibrillation, the reviewer, himself, has sometimes experienced such case accompanied with high-sensitivity troponin elevation but without significant atherosclerotic lesion in CAG. Meanwhile importance of minor elevation of high-sensitivity troponin in patients with chronic atrial fibrillation and its prognostic implication was reported as the author referred in their present manuscript.

1) Most important and essential issue: validation of type 1 MI in the present study
There was no concrete (detail) description regarding validation of the type 1 MI in the present study. The concrete and detail conditions for the validation of type 1 MI in the present study should be described, especially their CAG or coronary CT/MRI findings (detail findings and corresponding patient numbers) and/or myocardial RI/MRI findings (detail findings and corresponding patient numbers) should be shown in the new table or added in table 1, which should clarify backgrounds of patients with validated type 1 MI in the present study.

2) New onset (or paroxysmal) atrial fibrillation versus chronic atrial fibrillation:
Both patients with new onset (paroxysmal?) atrial fibrillation and persistent fibrillation were included in the present study. The reviewer guess that there were some differences in the troponin release-kinetics between the two groups, which might be more important rather than type 1 plaque rupture? Comparative analysis are expected. Duration of atrial fibrillation, heart rate and BP at the onset also significantly influence (relate to) the occurrence of ischemic myocardial
injury and troponin release kinetics. Additional analyses regarding these points are also expected.

3) Additional analyses:

Statistical analyses were adequate in the submitted manuscript, and the reviewer expects further analyses regarding the issues described above (#1, #2). The reviewer would like to propose a multivariable analysis for the prediction of the occurrence of type-1 MI in these particular patients, new or paroxysmal onset atrial fibrillation? HR and BP? CAG findings? coronary risk factors?

**Quality of written English:** Acceptable

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

**Declaration of competing interests:**

I have no competing interests.