Reviewer's report

Title: Rapid decrease in carotid plaque lipid content as assessed by magnetic resonance imaging during treatment of rosuvastatin

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Reviewer: Tzung-Dau Wang

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In this manuscript, the authors assessed the effects of lipid-lowering by rosuvastatin for 24 months on the volume of carotid plaque and its lipid content in 32 dyslipidemic subjects with established carotid plaques of 16-69% diameter stenosis identified by ultrasonography. Instead of the 47% reduction in LDL cholesterol levels, the authors noted a sustained reduction in MRI-defined lipid content (~10% reduction) but not total plaque volume. Despite several similar published studies had been done in Caucasian population, this article is of value in providing relevant data in the Chinese population. However, there are several substantial deficiencies (major compulsory revisions) to be improved as listed below.

Major compulsory revisions

1. Despite the authors pronounced that the method of automatic quantification of lipid-rich necrotic core and plaque volume is validated, it seems that there was an obvious error in Figure 3 they provided to demonstrate the automatic MRI imaging analysis. First, in the right column images of Figure 3, the lumen was not accurately delineated. In fact, they included both lumen and plaque and erroneously regarded both as “lumen”. Second, it is obvious that some white portions were included in the so-called “lipid-rich necrotic core”, which should be black in the MRI imaging, in quite a few sections (first row, second to the right; fourth row, second to the right). The authors MUST provide more-accurately delineated images in Figure 3.

2. Considering the inherent biases with the automatic quantification method, the authors should mention there was no change in total plaque volume (wall volume) first, and then the reduction in lipid-rich necrotic core (particularly in the Abstract) to provide a more balanced view. The authors must also provide data about the repeatability of their automatic imaging analyses about wall volume, lipid-rich necrotic core volume, etc. The authors should also mention the inherent inaccuracy of this automatic imaging analysis method as one of the study limitations.

3. Because the control group was not included in this study, the authors cannot exclude the possibility that lipid-rich necrotic core could turn into fibrosis in months as a natural process. Therefore, the observed “rapid” decrease in lipid content might just be a natural biological process rather than a response to the
lipid-lowering therapy. The authors should state this in the study limitations section.

4. The authors should summarize results from previous similar studies regarding the extent of plaque volume reduction, lipid core reduction, and lumen changes and its time course and show this information in a Table to make readers have a comprehensive understanding about this issue. In fact, the authors should provide information about sample size estimation in this study. All the above data formed the basis for sample size estimation, which was not provided in this manuscript.

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

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 that I have no competing interests