Reviewer's report

Title: Endocardial Border Delineation Capability of a Novel Multimodal Polymer-shelled Contrast Agent

Version: 1
Date: 26 May 2014

Reviewer: Daniele DR Rovai

Reviewer's report:

The authors of this study evaluated a novel ultrasound contrast agent in a porcine model. The manuscript might be of interest to the readers of the journal, but is affected by several limitations.

Major Compulsory Revisions.

The name of the novel polymer-shelled contrast agent with high mechanical and chemical stability [5] should be provided.

Minor Essential Revisions.

Background. It is not clear which agent the Authors refer to in the first sentence of the manuscript. "An intravenously injectable contrast agent consisting of gas-filled microbubbles (MBs) with a mean diameter of 2-5 µm can be used for improved image quality during ultrasound examinations, which results in diagnostic benefits." Is this a general statement or do the authors refer to the agent under study? If this is the case, the sentence should be rephrased because it looks more like a conclusion.

Methods. The Authors should provide more data on the new contrast agent. The median diameter of the microbubbles, the interquartile range and possibly the frequency distribution of microbubble size should be provided. The gas inside the microbubbles should be mentioned, as well as its characteristics. Information about the microbubble shell would also be welcome.

Results. Regarding contrast agent safety, the Authors reported in the abstract: "Moreover, neither high nor low doses of the polymer-shelled CA significantly affected the physiological variables." Because a few variables were monitored (SaO2, HR, and arterial blood pressure), please limit your statement to the explored variables. Any data regarding right heart hemodynamics?

The fact that SonoVue produced significantly better endocardial border delineation than the polymer-shelled CA in the mid-cavity and basal regions of the left ventricle is not trivial, since these are the regions where endocardial borders are often less delineated in echocardiography. This result should be reported in the abstract.

Did the authors measure the improvement in endocardial border delineation obtained after contrast with respect to the native endocardial border delineation?
Please specify the meaning of Dice the first time it is mentioned.

Discussion. The statement that ".... the polymer-shelled CA might be expected to allow better visualization of both the apical and the basal regions because higher MI was used for the polymer shelled CA (MI = 0.89–0.93) compared with SonoVue (MI = 0.39)" seems in contrast with the results of the study.

Discretionary Revisions

For the Reviewer's curiosity, why was an apical two-chamber view selected for image acquisition?

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 have no competing interest to be declared