

Response to the Editor/reviewer's comment

Thank you for giving us the opportunity to submit a revised draft of the manuscript. We are most grateful for the time the editors and reviewers spent on providing suggestions on how to improve our paper. In our revision, we have tried to address all the queries raised by the editor and the reviewers'.

Well-written manuscript considering a hot topic in the field. Conduction System Pacing is a new modality that is promising and is only becoming more and more popular. I think the manuscript should have a clearer message/suggestion to society on what is needed to improve the shortcomings and not only ask for more RCTs.

Response: Thank you for the kind words of appreciation. We acknowledge your efforts in reviewing our paper and giving us invaluable suggestions which will surely improve the quality of the paper and it's overall impact.

Here are my comments that I believe could improve the manuscript.

- 1) I think it is important that clarify that CRT was introduced as a treatment for dyssynchronous heart failure, which around 25% of those cases are pacing-induced (upgrades from dual-chamber to CRT).

Response: A very valid point by the reviewer which we had not included in the prior version of our paper. We have accordingly, added this piece of information in the text in the revised paper.

- 2) Non-physiological activation is a limitation for all types of pacing and not only for CRT. I think it is important to say and specify that one of the main reasons for the high non-response rate in CRT is the limited pacing sites constrained by the CS branches and CSP will also be good for patients indicated for de novo CRT (not upgrades).

Response: We thank the reviewer for reminding us of this very important cause of BiVP-CRT non response. We have included the same and added the fact that CSP offers a good option for these patients.

- 3) The biggest reason for the high non-response in CRT is that there is no objective measure that could indicate the effectiveness of the therapy acutely due to the remodelling involved. This limitation will exist for CSP also. Therefore, I think it is important to mention that there is a great need for a way to accurately determine/predict the response and enable optimization.

Response: Another excellent point by the reviewer which has significant clinical implications. Indeed, our inability to predict convincingly non-response after CRT in the lab remains the major limitation. Despite the fact that certain clinical and electrocardiographic variables have been identified in recent studies, no objective parameter can tell us the acute response. Commonly used parameters in lab at the time of implantation to predict post implantation response including biventricular activation times and biventricular dyssynchrony indexes do not necessarily correlate with ejection fraction and cardiac chamber volumes at 1 year. The same holds true for all types of pacing modalities. We have discussed the same in text.

- 4) When talking about optimization, it is important to mention HOT-CRT and LOT-CRT as there have been conducted some important studies on that.

Response: We thank the reviewer for highlighting the same and bringing it to our notice. We have included the most recent data on these modalities in text and discuss the current status of these tools in clinical practice.

- 5) CSP for CRT is more complex than CSP for no-myopathic issues. For patients with LBBB, the pacing site must be placed distal to the block, and one should be cautious that whatever condition caused the block does not cause another block later. For non-LBBB patients, identifying where to pace for the best results is also difficult, which is why HOT-CRT and LOT-CRT may be the best option.

Response: We thank the reviewer for highlighting another very relevant issue and bringing it to our notice. Accordingly, we have included same discussion in text.

- 6) It is important to mention the difference between direct LBB pacing and LBB area pacing, including what is expected/needed from the industry in terms of devices to improve CSP.

Response: We acknowledge the reviewers comments and have provided the differences between direct LBB pacing and LBB area pacing in text. Also we have highlighted the further advancements in the delivery system and pacing technologies to fix the common pitfalls of these modalities.

7) I think the reader would benefit from an illustrative figure describing the various pacing strategies mentioned above.

Response: As per the reviewers suggestion, we have provided a figure highlighting the same. Please refer to figure 1.

Further as per the suggestion we have got the paper edited by an English expert and fixed the grammatical errors. If there are any other concerns or specific errors, do guide us.

Once again we express our sincere thanks and gratitude to all the editor and the reviewers comment for providing valuable insights into our paper. we believe that these comments indeed go a long way in improving the overall quality and clinical impact of our research in the future.