Analysis of tricuspid regurgitation improvement following cardiac resynchronization therapy—Authors’ reply

This is a response to the Letter to the Editor, EUPC-D-22-01151 ‘Analysis of Tricuspid Regurgitation Improvement Following Cardiac Resynchronization Therapy’ by Syed Youyaf Ahmad et al. [https://doi.org/10.1093/europace/euad007], about the article ‘Tricuspid regurgitation after cardiac resynchronization therapy: evolution and prognostic significance’ by Stassen et al. https://doi.org/10.1093/europace/euac034.

We thank Dr Ahmad and his colleagues for their interest in our study, which evaluated the beneficial effects of cardiac resynchronization therapy (CRT) on tricuspid regurgitation (TR) severity and outcomes.1 Previous studies have shown that significant TR is frequently observed in patients with heart failure and is independently associated with worse outcomes.2,3 Because right ventricular (RV) dysfunction is the major driving force of secondary TR, therapeutic strategies should first aim to attenuate or reverse RV dilation, thereby improving the imbalance between the tethering and closing forces of the tricuspid valve. The results of our recently published study showed that CRT has the ability to reduce RV dimensions and improve TR severity in up to 40% of patients with pre-existing moderate and severe TR.

Unfortunately, lead-induced TR is frequently observed after implantation of a cardiac implantable electronic device and is associated with increased mortality and heart failure hospitalizations.4 In this regard, Dr Ahmad and coworkers highlight the theoretical advantages of His bundle pacing (HBP) over ‘classical’ CRT. His bundle pacing activates the His–Purkinje system directly, resulting in an efficient physiological and synchronized ventricular activation, thereby alleviating the detrimental effects of asynchronous ventricular activation (which contributes to the development of TR). In addition, an HBP lead can be implanted above the tricuspid annulus, which further reduces the probability of lead-induced TR.

We acknowledge that, at least in theory, HBP holds great promise in preventing lead-induced TR. However, HBP has many other disadvantages such as the difficulty of lead implantation, lower success rates in patients with QRS prolongation, reduced R-wave amplitudes, and high and unstable pacing thresholds. These disadvantages may perhaps not outweigh the advantage of a reduction in TR. Left bundle branch pacing is an alternative mode of conduction system pacing and partially overcomes these disadvantages. However, in these patients, the lead is usually placed through the tricuspid annulus.

Most of all, it should be emphasized that the beneficial effects of ‘classic’ CRT have been proven in multiple randomized, controlled trials, and current guidelines of the European Society of Cardiology strongly recommend CRT in well-selected patients to reduce heart failure hospitalizations and mortality.5 Because randomized controlled trials on HBP are currently lacking, cardiologists should be very careful when choosing HBP over CRT in these heart failure patients. Before recommending HBP as an opportunity to reduce TR in patients needing CRT, prospective randomized clinical trials are needed to evaluate whether HBP is equal to or better than conventional CRT in patients with heart failure.

Conflict of interest: The Department of Cardiology, Heart Lung Center, Leiden University Medical Centre received research grants from Abbott Vascular, Bayer, Biotronik, Bioventrix, Boston Scientific, Edwards Lifesciences, GE Healthcare, Ionis, and Medtronic. J.J.B. received speaker fees from Abbott Vascular. J.S. received funding from the European Society of Cardiology (ESC Training Grant App000064741).

References

Jan Stassen 1,2 and Jeroen J. Bax 1,3,4
1Department of Cardiology, Leiden University Medical Center, Leiden, The Netherlands; 2Department of Cardiology, Jossa Hospital, Hasselt, Belgium; and 
3Turku Heart Center, University of Turku and Turku University Hospital, Turku, Finland
4Corresponding author. Tel: +31 71 526 2020; fax: +31 71 526 6809. E-mail address: jj.bax@lumc.nl

© The Author(s) 2023. Published by Oxford University Press on behalf of the European Society of Cardiology.

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial License (https://creativecommons.org/licenses/by-nc/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com