Comparison of repolarization indices between His bundle and biventricular pacing

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Introduction: His bundle pacing (HBP) has been shown to improve cardiac function in patients with LV dysfunction with comparable benefits of cardiac resynchronization therapy (CRT), however, there is limited information regarding their effect on cardiac repolarization playing role in arrhythmogenesis.

Methods: We analysed the data of consecutive patients with left ventricular dysfunction who underwent HBP and CRT between January 2017 to January 2019. Patients undergoing HBP (Group 1) were compared to those undergoing conventional CRT (Group 2). The following ECG parameters were measured in all patients: QTc, T peak to end (Tpe) and Tpe/QTc. ECG measurements were done pre-implant (PRE), immediately post-implant (IM POST) and > 6 weeks after implants (6W POST). All ECG parameters were measured from surface ECG and Cardiotek EP tracer.

Result: There were 13 patients in Gr.1 and 16 in Gr.2. Baseline characteristics were similar except for a wider QRS in in Group 2 (109.77±31.2 Vs 162.56±22.3, p=0.025). Width of QRS were similar soon after the implant (106.77±15.91 Vs 123.87±15.61, p=0.7) in both the groups. At baseline, there was no significant difference in following repolarization parameters e.g. QTc, Tpe, Tpe/QTc between both groups (table 1). In Group 1 there was a significant reduction in Tpe and Tpe/QT (90.54 ± 24.347 Vs 69.62±12.92, p=0.007 and 0.203 ± 0.045 Vs 0.151 ± 0.027, p=0.002 respectively) immediately post implant and in Tpe/QTc (0.151±0.027 Vs 0.132±0.041, p value-0.05) 6 weeks after implant (Table 2). There was a significant difference in Delta1 Tpe/QTc (p value- 0.02) between Gr.1 and Gr.2 (Delta1 = difference between IM POST and PRE parameters) but Delta2 (showing the difference between IM POST and 6W POST value) of Tpe, Tpe/QTc and QTc do not differ significantly in between them. Over the median observation period of 11 months only 1 patients developed single episode of VT requiring therapy belonging to Gr 1 whereas from Gr.2, 6 patients developed total 11 episodes of VT requiring therapy for 2.

Conclusion: Compared to conventional CRT, HBP reduced Tpe and Tpe/QTc intervals after implantation from the baseline. Further large prospective studies are needed to establish if these changes result in reduction of arrhythmic burden among patients undergoing HBP over CRT.