

# Prevalence of Left Ventricular Dyssynchrony in Patients with Congenital Atrioventricular Block and Long-Term Pacing: A Three-Dimensional Echocardiography Study

Dear Editor,

We read with great interest the study by Guerra et al., which is the first study that applied real time three-dimensional echocardiography (RT3DE) to evaluate left ventricular (LV) dyssynchrony in patients with congenital atrioventricular block (CAVB) and pacemaker. The authors conclude that there is a good agreement between LV dyssynchrony by tissue Doppler imaging (TDI) and RT3DE and also that there is a negative correlation between the LV ejection fraction and systolic dyssynchrony index by RT3DE.

Many studies in the past have shown that chronic ventricular pacing induces ventricular dyssynchrony, which may cause adverse LV remodeling and worse long-term outcome.<sup>1,2</sup> The TDI echocardiographic technique has been used by most studies to evaluate dyssynchrony. However, this method has some important limitations, mainly related to significant inter-observer variability and the angle-dependence of the technique.<sup>3,4</sup> In this scenario, RT3DE allows a more accurate semiautomatic image analysis, with more precise information and simultaneous analysis of all myocardial segments. RT3DE has the potential to become the method of choice for LV dyssynchrony induced by pacing.<sup>5</sup>

CAVB is a rare condition, manifesting itself in a broad age range that affects individuals from the fetal period to adulthood. It is known that most of these patients will develop dilated cardiomyopathy and that the presence of autoantibodies increases the risk of left ventricular dysfunction after pacemaker implantation.<sup>6</sup> In addition, several diseases acquired during adulthood may influence the development of ventricular dysfunction and dyssynchrony. The authors suggest that dyssynchrony can lead to ventricular dysfunction but do not describe the coexistence of comorbidities or structural heart disease, factors that can be associated with the development of dilated cardiomyopathy.

Previous studies have shown that ventricular pacing correlates with the development of dyssynchrony, ventricular dysfunction, and worse long-term outcomes.<sup>7</sup> We believe the authors should comment on this issue, as there may be

variability of stimulation among the evaluated patients that can influence dyssynchrony and LV function.

Finally, analysis of ventricular dyssynchrony by TDI is complex and can be performed using different methods. As recommended by the American Society of Echocardiography, this evaluation should be made using TDI-based opposing wall delay, with a cutoff value of 65 milliseconds or more for significant dyssynchrony, or using the Yu index where longitudinal TDI velocities from three standard apical views are assessed (cutoff value greater than or equal to 33 milliseconds).<sup>3</sup> We believe both of these indices of dyssynchrony should be used for the determination of agreement between TDI and RT3DE.

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