Additional factors underlying pacing-induced cardiomyopathy in patients who underwent right ventricular pacing and His bundle pacing. Author's reply

Jan Mizner[1], Petr Waldauf[2], Domenico Grieco[3], Hana Linkova[1], Oana Ionita[1], Pugazhendhi Vijayaraman[4], Robert Petr[1], Radka Raková[1], Jana Vesela[1], Petr Stros[1], Dalibor Herman[1], Pavel Osmancik[1], Karol Curila[1]

[1]Cardiocenter, 3rd Faculty of Medicine, Charles University and University Hospital Kralovske Vinohrady, Prague, Czech Republic
[2]Department of Anesthesia and Intensive Care, Charles University and University Hospital Kralovske Vinohrady, Prague, Czech Republic
[3]Department of Cardiology, Policlinico Casilino of Rome, Rome, Italy
[4]Geisinger Heart Institute, Wilkes Barre, Pennsylvania, United States

Correspondence to:
Karol Curila, MD, PhD, MSc, Cardiocenter, 3rd Faculty of Medicine, Charles University, Srobarova 50, 100 34 Prague, Czech Republic, phone: +420 2 6716 2621, e-mail: karol.curila@fnkv.cz

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Thanks to Dr. Şener for their comments. We agree that concomitant diseases such as cardiac sarcoidosis (CS) and amyloidosis (CA) might influence the clinical course in patients with bradycardia. The clinical spectrum of transthyretin cardiac amyloidosis (ATTR-CA) symptoms includes advanced conduction disorders requiring pacemaker implantation. It had been documented that 3%–13% of ATTR-CA patients had pacemakers implanted before they were diagnosed with CA [1]. However, in the European population, the prevalence of ATTR-CA in pacemaker patients was very low (only 2%) [2]. Cardiac sarcoidosis (CS) also leads to advanced symptomatic atrioventricular blocks, and according to Kandolin et al. [3], it was the first symptom in up to 44% of patients with diagnosed CS. However, the prevalence of CS remains very low in the European population, where it is a rare condition. We initiate further diagnostic steps only if other risk factors are present [3]. Therefore, we believe that the low prevalence of these diseases and the randomized study design should not affect the differences in the left ventricular ejection fraction between studied groups. On the other hand, we agree that due to the pathophysiology of the diseases, scanning for CS and CA could be helpful while measuring the markers of collagen metabolism.

Pharmacological treatments, such as SGLT2 inhibitors and others, may influence left ventricular ejection fraction and myocardial fibrosis. We have not provided their numbers, but SGLT2 inhibitors were not as available during the study period as they are now. Again, the randomized nature of the project should minimize their effect on the results.

We also agree that it is possible to adjust the pacemaker programming to avoid ventricular pacing. On the other hand, it is known that sacrificing atrioventricular synchrony at the cost of AV delay prolongation promotes atrial fibrillation and may worsen patients' clinical course. In light of this information and our experience, we are convinced that right ventricular pacing is fundamentally inappropriate treatment for bradycardia. It increases ventricular dyssynchrony, while His bundle pacing and left bundle branch pacing do not [4].The pacemaker's primary purpose should be to keep an adequate heart rate and preserve the atrioventricular and ventricular synchrony as close to the physiological state as possible. Moreover, it should also follow other physiological needs of the human organism: not only a decline in the basal heart rate during rest or sleep but also a change in the heart rate in concordance with breathing [5].

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