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Heart rate acceleration is a poor surrogate of complete parasympathetic denervation of sinus node during cardioneuroablation

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Background: Ablation of superior paraseptal ganglionic plexi is invariantly associated with the acceleration of sinus rhythm. This is considered a favourable sign during cardioneuroablation for the treatment of recurrent neurally-mediated cardioinhibitory syncope or symptomatic sinus bradycardia.

Purpose: In this retrospective study, we investigated whether the magnitude of sinus rhythm acceleration corresponds with directly assessed sinus nodal parasympathetic denervation.

Methods: The study included 48 patients (age: 39 ± 13 years, 58% males) who underwent cardioneuroablation in general anaesthesia. The procedural endpoint was non-responsiveness (i.e. loss of original cardioinhibitory response) of the sinus node to extracardiac high-frequency stimulation of the vagal nerve. The magnitude of sinus rhythm acceleration was compared between patients who reached or did not reach this endpoint.

Results: All patients had positive atropine test (baseline heart rate: 65 ± 14 bpm; post-atropine: 109 ± 22 bpm). Complete sinus nodal denervation as assessed by vagal nerve stimulation was achieved in 44/48 (92%) patients. Intraprocedurally, heart rate accelerated from 54 ± 11 to 85 ± 14 bpm (difference: 31 ± 10; median 29; interquartile range: 24–40; total range: 13–61 bpm). This change did not correlate with age and was not related to pre-procedural post-atropine sinus rhythm acceleration. There was no difference in heart rate acceleration between the patient with and without sinus nodal denervation (Figure).

Conclusions: Sinus rhythm acceleration is not reliable endpoint for cardioneuroablation. Guidance by extracardiac vagal nerve stimulation may help to tailor the procedures to increase the clinical success rate and, at the same time, to avoid patient overtreatment.

Abstract Figure.