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Prevention of long-lasting atrial fibrillation through device therapy in dual-chamber pacemakers: analysis on 1384 patients of the role of Reactive ATP and atrial preventive pacing

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Background: Atrial fibrillation (AF) is the most prevalent heart rhythm disorder in clinical practice and it is associated with poor quality of life and increased risks of heart failure, dementia, stroke, and death. Moreover AF management is a huge cost for healthcare systems. AF is irregular, typically originates from the pulmonary veins, and as such, requires cardioversion to terminate persistent episodes. AF is not susceptible to pacer-termination, however, the MINERVA trial has shown that AF may transform in slower organized rhythms such as atrial flutter or atrial tachycardia, which can often be terminated by atrial antichycardia pacing (ATP); in particular by Reactive ATP, a specific ATP feature which can be re-armed when atrial arrhythmias get slower or more regular. The MINERVA trial showed that the combination of ATP, preventive atrial pacing algorithms and minimal ventricular pacing (MVP) was associated with lower progression to persistent and permanent AF, compared with standard DDD pacing mode and to MVP mode, in pacemaker patients with clinical history of AF.

Purpose: We aimed to confirm MINERVA trial results in real-world clinical practice and to evaluate whether AF prevention was associated with preventive atrial pacing or solely with ATP. Indeed in our project atrial preventive pacing algorithms were not enabled and the pacing mode (DDD or MVP) was chosen according to patients' AV conduction characteristics.

Methods: Consecutive dual-chamber pacemaker patients with sinus node

disease and device detected AT/AF were prospectively followed by 30 Italian cardiologic centers in an observational research. Clinical and device data were collected and reviewed by expert cardiologists to assess AT/AF occurrence through in clinic visit and/or remote transmissions of device data.

Results: A total of 239 patients (73 years old, 56% male) wearing a dual-chamber pacemaker with Reactive ATP were included in the project, followed for a median observation period of 13 months and compared with 1145 patients included in the MINERVA trial followed for a median observation period of 34 months and programmed with DDD pacing mode (383 patients), MVP (389 patients) and MVP+Reactive ATP+preventive algorithms (373 patients). As shown in the following figure incidence of 7 consecutive days of AF in the patients treated by DDD/MVP+Reactive ATP in real-world clinical practice was very similar to that found in the MINERVA trial arm programmed with MVP+Reactive ATP+preventive algorithms.

Conclusions: Our analysis performed in a population of sinus node disease patients with dual-chamber pacemakers confirmed MINERVA trial results in terms of prevention of long-lasting AF episodes. In particular these results confirm the benefit associated with the use of Reactive ATP, rather than preventive atrial pacing algorithms.

