

Atrial fibrillation in patients with sick sinus syndrome

Clinical and electrocardiographic predictors of atrial fibrillation after pacemaker implantation

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ABSTRACT

The present PhD dissertation is based on three submitted publications and an overview.

Atrial fibrillation (AF) is very common in patients with sick sinus syndrome (SSS). In patients with SSS referred for pacemaker implantation approximately 50% of the patients have had one or more episodes of AF – brady-tachy syndrome. AF is associated with an increased risk of thromboembolism and mortality.

In patients with SSS the selection of pacing mode has an impact on the development of AF. AAI pacing causes less AF, mortality, congestive heart failure and thromboembolism than VVI pacing, and DDDR pacing causes less AF than VVIR pacing, but it is still unsettled if AAIR pacing is superior to DDDR pacing. As AF increases morbidity and mortality a predictor would be valuable to reliably identify before pacemaker implantation whom among patients with SSS will later develop AF.

The occurrence of AF and thromboembolism in a randomised comparison of AAIR pacing and DDDR pacing in 177 patients with SSS was analysed. During a mean follow-up of 2.9 years AAIR pacing was associated with significantly less AF. The beneficial effect of AAIR pacing was still significant after adjustment for brady-tachy syndrome. Brady-tachy syndrome was associated with an increased risk of thromboembolism.

The sinus and the paced P wave duration and P wave dispersion were prospectively evaluated as predictors of AF after pacemaker implantation in 109 patients with SSS. After a mean follow-up of 1.5 years none of the ECG parameters did differ between patients with and without AF during follow-up. Nor was there any difference between groups after correction for brady-tachy syndrome and age. Brady-tachy syndrome was the strongest predictor of AF during follow-up.

As the pacemaker telemetry was used to detect AF, the probability of the pacemaker telemetry to detect AF using Holter recording as the golden standard was validated in 28 patients with SSS. Using our criteria for AF (an atrial high rate episode with a rate of ≥ 220 bpm for ≥ 5 minutes, atrial sensing with a rate of ≥ 170 bpm in $\geq 5\%$ of total counted beats, mode-switching in $\geq 5\%$ of total time recorded or a mode-switching episode of ≥ 5 minutes) the pacemaker telemetry was found a reliable tool for detecting AF in patients with SSS.

It was concluded that AAIR pacing causes less AF than DDDR pacing in patients with SSS, but a larger trial with extended follow-up is needed to confirm this result and to evaluate whether there are any differences in mortality, congestive heart failure and thromboembolism between these two pacing modes. Furthermore, brady-

tachy syndrome is still the most reliable predictor of AF in patients with SSS after pacemaker implantation and the use of the pacemaker telemetry to detect AF is a reliable way to evaluate the development of AF after pacemaker implantation.