Optimal Pacing Mode for Sick Sinus Syndrome

To the Editor:

I read with interest the article on the treatment of patients who have sick sinus syndrome (SSS) with single-chamber atrial pacing by Anderson et al. However, their finding of the annual risk of second- or third-degree atrioventricular (AV) block of only 0.6% per year contrasts somewhat with the reported findings that abnormal AV conduction was demonstrated in 57% to 67% of patients with SSS using invasive electrophysiologic techniques. Therefore, although Anderson et al demonstrated that abnormalities of AV conduction cause clinical problems only infrequently, it should be clear that a significant number of patients with SSS cannot be treated with atrial pacing alone. In these cases, dual chamber pacing (DDD or DDI, preferably with rate adaptation) should be the treatment of choice because the atrial transport function is then preserved.

The choice should not be restricted to dual-chamber versus single-chamber atrial pacing only. Another viable option in the treatment of SSS in these patients is ventricular pacing, which was first reported in 1968. Ordinarily, pacing from a ventricular site would not be expected to affect atrial ectopic activity. However, after successful ventricular capture following transvenous catheter pacing, atrial tachyarrhythmias often no longer recur. Two explanations can be offered. First, the improvement of atrial function through improved coronary circulation secondary to the restoration of an effective regular ventricular rhythm may favorably affect the stimulation and fibrillation threshold of the atria. Second, ventricular pacing causes constant retrograde depolarization of the AV node and the atria and, by suppressing the nodal and atrial ectopic pacemakers, not only prevents atrial tachyarrhythmias but also protects against competitive rhythm. Ventricular inhibited (VVI) pacing should be the procedure of choice when the dominating atrial rhythm is fibrillation or flutter but also protects against competitive rhythm. As long as dual-chamber pacing has not been proven to be clearly superior to single-chamber ventricular (VVI) pacing in these patients, AAi pacing should be the first treatment choice for patients with sick sinus syndrome who have normal AV conduction.

Tsung O. Cheng, MD
Professor of Medicine
The George Washington University
Washington, DC

Response

We thank Dr Cheng for his interest in our article showing that atrioventricular (AV) conduction remains stable during the long-term follow-up of patients with sick sinus syndrome who were treated with single chamber atrial (AAI) pacing. We are familiar with the older studies cited by Dr Cheng in which abnormalities in AV conduction can be seen using invasive techniques in a large proportion of patients with sick sinus syndrome. However, none of these abnormalities has been found to predict clinically important AV block in patients with sick sinus syndrome and, as a consequence, routine invasive electrophysiological testing is not recommended anywhere today before pacemaker implantation in these patients. Our results confirm the finding of a 0.6% annual risk of high-grade AV block that was determined in a meta-analysis of 28 studies on AAI pacing in sick sinus syndrome. Therefore, the risk of high-grade AV block requiring an upgrade of the AAI pacemaker is <1% per year if patients with sick sinus syndrome are selected carefully by using the following clinical criteria: no grade 2 or 3 AV block, a surface ECG PQ interval ≤0.22 s in patients ≤70 years and a PQ interval ≤0.26 s in patients >70 years, no bundle branch block, and 1:1 AV conduction during atrial pacing at 100 bpm. As long as dual-chamber pacing has not been proven to be clearly superior to single-chamber ventricular (VVI) pacing in these patients, AAI pacing should be the first treatment choice for patients with sick sinus syndrome who have normal AV conduction.

Henning Rud Andersen, MD, DMSc
Jens Cosedis Nielsen, MD
Poul Erik Bloch Thomsen, MD, DMSc
Leif Thuesen, MD, DMSc
Thomas Vesterlund, MD
Anders Kirstein Pedersen, MD, DMSc
Peter Thomas Mortensen, MD
Department of Cardiology
Skejby Sygehus
Aarhus University Hospital
Aarhus, Denmark

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Tsung O. Cheng

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