A pacemaker reduced the recurrence of syncope in patients with severe vasovagal syncope

Connolly SJ, Sheldon R, Roberts RS, Gent M, on behalf of the Vasovagal Pacemaker Study Investigators. **The North American Vasovagal Pacemaker Study (VPS). A randomized trial of permanent cardiac pacing for the prevention of vasovagal syncope.** J Am Coll Cardiol. 1999 Jan;33: 16-20.

Question

In patients with severe recurrent vasovagal syncope, can a dual-chamber pacemaker with rate-drop response reduce the rate of recurrent syncope?

Design

Randomized, unblinded, controlled trial with planned interim analyses.

Setting

16 clinical centers in North America.

Patients

Patients with ≥ 6 syncopal episodes and a positive tilt-table test result with syncope or presyncope and relative bradycardia. Exclusion criteria were other causes of loss of consciousness (ventricular tachycardia, complete heart block, postural hypertension, hypersensitive carotid sinus syndrome, or seizures); important valvular, coronary, myocardial, or conduction abnormality; previous pacemaker therapy; contraindications to a permanent pacemaker; or a major chronic noncardiovascular disease. 54 (mean age 43 y, 72% women) of the planned 284 patients were studied. Follow-up was 85%.

Intervention

27 patients were allocated to a permanent pacemaker (Medtronic Thera DR dual-chamber pacemaker with rate-drop response) that was to be implanted within 1 week of randomization. 27 patients were allocated to no pacemaker. All other treatment in both groups was done at the discretion of the treating physicians.

Main outcome measures

First recurrence of syncope. Secondary outcomes were presyncopal events and adverse events.

Main results

The study was stopped early when a clinical benefit was found. 1 patient refused the pacemaker; all patients were included in the intention-to-treat analysis. Patients in the pacemaker group had a lower rate of recurrence of syncope ($P < 0.001$) (Table) and a greater time to syncope (112 vs 54 d, $P < 0.001$) than those in the control group. The groups did not differ for the proportion of patients with ≥ 1 presyncopal event (74% in the pacemaker group vs 63% in the control group, $P = 0.6$) or any other measure of presyncopal events. There were 7 adverse events in the pacemaker group and none in the control group.

Conclusion

A permanent dual-chamber pacemaker reduced the recurrence of syncope, but not presyncopal events, in patients with severe recurrent vasovagal syncope.

Source of funding: Medtronic Inc.

For correspondence: Dr. S.J. Connolly, Hamilton Health Sciences Corporation, General Site-237 Barton Street East, McMaster University, Hamilton, Ontario L8L 2X2, Canada. FAX 905-521-8820.

Abstract and Commentary also published in *ACP Journal Club.* 1999;131:43.

Permanent pacemaker vs usual care for severe vasovagal syncope*

Outcome at 2 y	Pacemaker	Usual care	RRR (95% CI)	NNT (CI)
Recurrence	22.2%	70.4%	68% (38 to 85)	3 (1 to 5)

*Abbreviations defined in Glossary; RRR, NNT, and CI calculated from data in article.

Commentary

Previous studies have suggested a possible benefit of cardiac pacing in patients with vasovagal syncope (1, 2). The study by Connolly and colleagues, however, is the first randomized controlled trial to show this benefit. Although the treatment effect was dramatic, clinicians must apply the results of this study with caution.

An important issue for clinicians interpreting the results is the strict entry criteria and, hence, the limited generalizability of the results. It is unclear whether the results can be applied to patients with fewer syncopal episodes or to patients whose syncope has a cause other than bradycardia.

The authors did not clarify the medical regimens given to the control or treatment groups. They state that both groups received "any medical or nonmedical treatment, according to the judgement of their physician." This limits the ability to draw conclusions about the efficacy of a pacemaker compared with a standard medical regimen.

Finally, the study was terminated prematurely because of the dramatic treatment benefit of pacing. This led to a small study population with an unequal distribution of important clinical characteristics. On average, the pacemaker patients had fewer lifetime episodes of syncope (14 vs 35) and fewer episodes in the past year (3 vs 6) than the control patients. However, the authors point out that the relative risk reduction remained essentially unchanged when it was adjusted for differences in baseline clinical characteristics.

Despite the potential biases, this study makes an important contribution to the management of patients with recurrent vasovagal syncope. Dual-chamber cardiac pacing is clearly a reasonable alternative for patients with frequent syncopal episodes who have bradycardia associated with syncope or presyncope on tilt-table testing and in whom pharmacologic therapy has failed.

Carlton Moore, MD
Thomas McGinn, MD, MPH
Mount Sinai School of Medicine
New York, New York, USA

References

1. **Fitzpatrick A, Theodorakis G, Ahmed R, Williams T, Sutton R.** Pacing Clin Electrophysiol. 1991;14:13-9.
2. **Samoil D, Grubb BP, Brewster P, Moore J, Temesy-Armos P.** European Journal of Cardiac Pacing and Electrophysiology. 1993; 3:36-41.