LETTERS TO THE EDITOR

Reference

An Unusual Effect of Atropine on Overdrive Suppression

To the Editor:

By their elegant assessment of sinoatrial conduction during premature atrial stimulation, Strauss et al. (Circulation 47: 86, 1973) have uncovered one major limitation of the rapid atrial pacing as a method of evaluating sinoatrial node automaticity by post drive suppression. This and probably other yet undiscovered facts may account for the inconsistent results obtained by this technique including those from our center.1

During the past year we have been repeating the studies after the administration of 1 mg atropine intravenously. On several occasions we have noticed an apparently paradoxical prolongation after atropine of a previously normal post overdrive sinoatrial recovery time in patients who had the clinical classical picture of the sick sinus node syndrome.2

Most recently, we have evaluated a 64-year-old woman with sinus bradycardia, frequent sinus arrest, congestive heart failure, palpitations, and two previous episodes of near syncope occurring after usual activity. Premature atrial stimulation indicated high grade sinoatrial entrance block as outlined by Strauss et al. Sinus post overdrive recovery time was normal at rates 80, 100, 110/min for pacing durations of 30 sec, 60 sec, and 180 sec each time. Only after pacing at a rate of 120/min for one minute, did recovery time increase to 2.92 sec (fig. 1). Following 1 mg atropine intravenously, pacing at a rate of 120/min for one minute resulted in marked post drive suppression and an escape junctional rhythm with retrograde atrial capture of 4.9 sec. Sinus activity was apparent only after 18.3 sec (fig. 2).

Although actual sinus recovery may have occurred anytime between 4.9 and 18.3 sec and was suppressed by the retrograde junctional activity, nevertheless, this still represents marked delay.

We postulate that sinoatrial entrance block was reversed or significantly reduced by atropine, thus allowing more constant discharge of the sinoatrial node during atrial pacing which has unmasked its profound post drive suppression. We are currently in the process of evaluating this phenomenon in other patients; meanwhile we believe atropine should be given and recovery time reassessed whenever rapid atrial pacing fails to elicit a prolongation of sinoatrial recovery time in patients with the sick sinus node syndrome.

Tali Bashour, M.D.
Raul Hemb, M.D.
Rajasekaran Wickramesekaran, M.D.

References

The authors reply:

To the Editor:

We would like to thank Bashour et al. for their kind comments and interesting observations. Their data further emphasize the limitations of the overdrive suppression technique in the evaluation of sinus node automaticity in patients. As we have pointed out1 evaluation of sinus node automaticity in patients using the overdrive suppression technique is dependent on successful sino-atrial conduction in the retrograde direction during and in the antegrade direction immediately following the period of atrial pacing.

Figure 1

Simultaneous leads I, II and V1 of the electrocardiogram, right atrial electrogram (RA) and His Bundle Electrogram (HBE). After cessation of pacing at a rate of 120/min, sinus recovery is observed after 2.92 sec. Time lines = .04 sec. Paper speed = 75 mm/sec.
An Unusual Effect of Atropine on Overdrive Suppression
TALI BASHOUR, RAUL HEMB and RAJASEKARAN WICKRAMESEKARAN

Circulation. 1973;48:911
doi: 10.1161/01.CIR.48.4.911

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 1973 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/48/4/911.1.citation