Atrioventricular Block Induced by Exercise Is Not Always Infrahisian

To the Editor:

We present the case of a patient with no structural heart disease who had complete paroxistic atrioventricular block (AVB) induced by exercise, with suprahisian block demonstrated by electrophysiology study (EPS).

The patient, a 71 year-old, hypertensive, diabetic woman with no other history of note, was referred to the emergency department with a 2-week history of asthenia and general malaise. Physical examination revealed arrhythmia, with no murmur or signs of heart failure; the remainder of the examination was unremarkable. A baseline electrocardiogram (ECG) showed Mobitz type II second degree AVB with a 3:1 conduction ratio and a narrow QRS complex (Figure 1). The only laboratory finding of note was mild hypokalemia (3.1 mEq/L). A few hours after admission the ECG was normal, with a PR interval of 216 ms and potassium concentrations of 3.6 mEq/L. Twenty-four hours after admission, however, she again suffered AVB, similar to the episode on admission, although this time the ionogram was normal. An EPS was undertaken to evaluate the distal conduction.

The EPS showed an HV interval of 36 ms and advanced suprahisian block, which became complete after atrial sti-
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mulation at 500 ms, as well as spontaneously, and even after
the administration of 1 mg of atropine (Figure 2).

An ergometry test was undertaken to rule out the possibili-
ty of an ischemic origin. At the start of the test the patient was
in sinus rhythm, with a normal PR interval of 68 beats per
minute. After 3 minutes, and with tachycardia of 90 beats per
minute, she suddenly presented a complete AVB with a heart
rate of 42 beats per minute and nodal escape rhythm (Figure
3), with no chest pain. Exercise was continued until the fifth
minute, when she presented widening of the QRS complex
with persistence of the complete AVB, and the test was termi-
nated. She recovered normal sinus rhythm 7 minutes after fi-
nishing the test. Coronary angiography showed absence of
significant angiographic lesions. After placement of the defini-
tive pacemaker, the patient remained asymptomatic. At the
control visit 3 months after implantation of the pacemaker,
complete AVB persisted with nodal escape.

Complete AVB induced by exercise is a relatively uncom-
mon entity. In those cases where an EPS was carried out,
an alteration of the infrahisian conduction was always detect-
ed, except in the cases with concomitant ischemic heart dis-
ease. In 1997 Rumoroso et al reported 4 cases and reviewed
the literature. Since then, 3 new cases have been reported,
with similar findings to those reported previously.

The case presented here differs in some respects from the
one previously reported. Firstly, the ECG on admission
showed advanced, symptomatic AVB. However, unlike the
other cases, most of which presented at least right bundle
branch block, when our patient recovered normal sinus rhythm
the ECG showed no conduction disorder or bundle branch
block. Secondly, the EPS showed an alteration of the
supraventricular conduction, although no test was carried out with
procaïnamide. The disorder was seen on atrial stimulation,
both spontaneously and even under the effect of atropine,
which, with supraventricular involvement, should have improved
conduction. This finding suggests that the adrenergic effect in-
duced during exercise could, perhaps, itself have reproduced
the block. Thirdly, the presence of a ventricular escape rhythm
during the exercise stress test suggests that during adrenergic
discharge not only the supraventricular conduction, but also the
distal conduction was affected, when this could not be demon-
strated during the EPS. Finally, the finding of a normal coro-
nary arteriography rules out an ischemic etiology, although it
do not discard the possible presence of vasospasm.

Regarding the management of these patients, Rumoroso
et al proposed individualized treatment if there were no
symptoms or conduction disorders on the baseline ECG.
Given that our patient was symptomatic, the decision to im-
plant a pacemaker was endorsed by the fact that complete
AVB persisted after 3 months.

The etiology of this type of bundle branch block is proba-
ably degenerative, and independent of its degree of severity,
the level of the block can be either supraventricular or infr-
atrial. Although the prognosis varies according to the
level at which the block occurs, if there are symptoms and
once any reversible etiology has been ruled out, the treat-
mint involves the implantation of a pacemaker.

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