Exercise-induced high-degree atrioventricular block

Ludivine Wissocq, Pierre Vladimir Ennezat, Frederic Mouquet*

EA 2693, pôle de cardiologie et maladie vasculaire, CHRU de Lille, université Lille-2, boulevard Professeur-Leclercq, 59037 Lille cedex, France

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A 73-year-old woman was referred for exertional dizziness. She had no medical history and a clinical examination was unremarkable. An electrocardiogram at rest showed isolated hemi-left anterior fascicular block (Fig. 1). Echocardiography at rest showed normal systolic function (Movie 1). During exercise echocardiography, global systolic function and regional wall motion remained unchanged (Movie 2) but sudden bradycardia occurred after the patient’s heart rate reached 140 beats per min (Movie 3). The patient reported dizziness and an electrocardiogram showed 2/1 atrioventricular (AV) block followed by high-degree AV block. The same symptoms and a similar conduction abnormality were reproduced by a treadmill exercise test (Fig. 2) with no ST-segment deviation. Coronary angiography revealed normal coronary arteries. Exercise-induced high-degree AV block of a degenerative aetiology was therefore diagnosed. An electrophysiology study was not performed because the AV conduction abnormality clearly reproduced the patient’s symptoms. A dual-chamber pacemaker in DDD mode was implanted.

Exercise-induced AV block is an uncommon event. Most cases are 2/1 AV block with the need for an electrophysiology study to determine the necessity for implanting a pacemaker [1,2]. Patients with exercised-induced AV block may have a normal resting electrocardiogram [3]. Our patient showed symptomatic high-degree AV block, as assessed by two different exercise tests. Since an ischaemic aetiology has been reported [4], we performed coronary angiography, although the absence of a regional wall-motion abnormality and the absence of ST-segment depression did not suggest an ischaemic cause.
Figure 1. Electrocardiogram at rest showing isolated hemi-left anterior fascicular block.

Figure 2. Treadmill exercise test showing exercise-induced high-degree atrioventricular block.
In conclusion, exercise-induced AV block is uncommon, especially high-degree AV block. Exercise tests are non-invasive and should be performed systematically to assess exercise-induced symptoms.

Conflicts of interests

None.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.acvd.2009.06.003.

References