CASE REPORT

Anabolic androgenic steroid-induced Takotsubo cardiomyopathy

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SUMMARY

Anabolic steroid abuse, aimed at increasing muscle mass, has been growing in recent years. We describe a case of a 25-year-old bodybuilder who, after taking nandrolone and stanozolol, presented with Takotsubo syndrome. The angiography showed a normal coronary anatomy with the absence of stenosis. The left ventricular function was completely normalised after 1 week.

BACKGROUND

Anabolic steroid abuse (AAS) by professional and amateur athletes is a growing problem. These substances can have serious side effects, sometimes lethal. Often, the cardiovascular system is involved, sometimes in an unusual way.

CASE PRESENTATION

We present a case of a 25-year-old bodybuilder with a 2-pack-year cigarette smoking habit who, as an adolescent, had undergone a total thyroidectomy for Basedow syndrome. In order to increase muscle mass, he subjected himself to a cycle of anabolic steroids consisting of injection of nandrolone 100 mg/week and stanozolol tablets 25 mg/day. One night, after 3 weeks of steroid use, he developed chest pain radiating to the shoulder, associated with nausea and sweating. The next morning, considering the persistence of his symptoms, he presented to the emergency room where ECG showed ST significantly over the limit in the inferior leads and side (figure 1), and hypoakinesia anteroapical with systolic function moderately depressed (40%). The patient was subjected to

Figure 2 Left ventricle angiography showing apical ballooning.

primary angioplasty protocol for suspected acute coronary syndrome. An objective examination did not detect signs of congestive heart failure. Coronarography did not detect disease of the large epicardial branches, but ventriculography highlighted the characteristic 'apical ballooning' typical of Takotsubo syndrome (figure 2).

Blood tests showed an increase in high-sensitivity troponin, peaking in 3 days at 1292 ng/L (normal range <15 ng/L). No psychotropic substances such as cocaine or amphetamine, and no alcohol or illicit drug consumption (often used by patients

Figure 1 ECG showing ST elevation in inferior and lateral leads.

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Figure 3 Cardiac MR showing normal wall motion and regular perfusion after 2 weeks.

with AAS) were detected. Lipids were normal while the thyroid-stimulating hormone was very high (15 750 mUI/L). (The patient had also stopped taking levothyroxine.) Hospitalisation was clinically uneventful. A week after discharge, follow-up cardiac MR showed normalisation of systolic function with normal perfusion (figure 3).

DISCUSSION

Takotsubo cardiomyopathy, a syndrome with a usually favourable prognosis,¹ is characterised by changes in the ECG that simulate an acute frontal myocardial infarction with slight enzymatic increase and absence of coronary lesions.² The imaging examination shows an akinesia with a 'ballooning' aneurysmatic attitude³ at the level of the middle apical portion of the left ventricle, with compensatory hyperkinesia in the basal segments. The examination will return normal results

within a couple of weeks, as shown in our cardiac nuclear MR. The name derives from the shape that the left ventricle assumes at the echocardiographic examination and ventriculography: it looks like a Japanese octopus trap ('tako=octopus; tsubo=trap'). The aetiology of this syndrome may be determined by the excessive release of catecholamines, coronary spasm and microvascular dysfunction associated with it. In this case, the hypothyroidism may have contributed to catecholamine sensitivity in the setting of increased circulating catecholamines associated with AAS.⁴ The AAS could have induced this syndrome by its ability to stimulate the thrombogenicity, and promote the increase of vascular tone and catecholamines, causing severe dysfunction of the coronary microcirculation.⁵

Learning points

- ▶ Anabolic steroid abuse can have dangerous side effects for life, due to the damage that it causes to the cardiovascular system.
- ▶ A case similar to this has never previously been observed. Takotsubo syndrome should be studied further.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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