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Case Report

Use of Dietary Supplement with Ephedrine and Ischemic Stroke

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Abstract

The consumption of dietary supplements containing ephedrine and other alkaloids derived from them is quite high all over the world and is mainly used for the purpose of weight loss

This consumption has several risks for the general population and for the regulators, since their dissemination is faster than the clinical trials that prove and guarantee its effectiveness and safety of use.

We present a case of a 50 year old male patient who regularly took Ephedrine Level. Although he did not present risk factors for cardiovascular disease, he was admitted, in a hospital unit, due to an acute sensory-motor deficit of the left hemi body.

ABBREVIATIONS

CT: Computer Tomography; MCA: Middle Cerebral Artery

INTRODUCTION

Ephedrine is a sympathomimetic amine whose consumption is quite high in dietary supplements for weight loss. Derived from plants of the genus Ephedra, which has more than 40 species distributed in temperate and subtropical regions.

For several centuries it has been consumed for therapeutic purposes in China: initially the extract of the dehydrated plant (called Ma huang) was used for the treatment of respiratory conditions and, more recently, ephedrine was used as a nasal decongestant, bronchodilator and vasoconstrictor, but its use has been restricted by doubts regarding its security profile [1].

Currently, the consumption of dietary supplements that contain ephedrine and other alkaloids derived from them is quite high all over the world for the purpose of losing weight and energy enhancement, improving physical performance.

However, clinical studies have shown that there is only a slight short-term weight loss (about 0.9 kg / month more than placebo) [2], and there is no evidence of its efficacy in long-term weight loss and improvement of physical performance.

On the other hand, its consumption is associated with an increased risk of psychiatric problems (insomnia and anxiety), gastrointestinal symptoms and heart palpitations.

Adverse events related to the consumption of dietary supplements containing ephedrine and its alkaloids have involved cardiovascular and central nervous system symptoms.

The most frequent adverse event was hypertension, followed by palpitations and/or sinus tachycardia, stroke and seizures. There was also a report of death and permanent disability of patients [3].

CASE PRESENTATION

A 50-year-old male, event producer regularly took Ephedrine Level 50mg one capsule per day, for the previous three months,with the purpose of losing weight. He was admitted to a hospital unit, due to an acute installation of sensory-motor deficit in the left hemi body.

He reported onset of right temporal headache of maximum intensity 9/10 and spontaneous relief in about 30 minutes, associated to imbalance of gait without preferential side. Upon arrival at the hospital, he presented left hemiparesis with left central facial paresis and moderate dysarthria, pallor, sweating and left upper limb paresis. He also referred insomnia and increasing anxiety in the last month, but denied seizures, gastrointestinal symptoms or heart palpitations.

He denied personal or family history of hypertension, diabetes, dyslipidemia, varicose veins, or vascular disease, heart disease (arrhythmia), lower limb and pulmonary thromboembolism,

sudden death and stroke. He also denied smoking or alcohol intake or toxicophylic habits.

At admission, the patient had a blood pressure of 132/73 mmHg. On neurological examination he showed himself to be wry, oriented in time and place and followed simple orders. He presented moderate dysarthria, left anesthesia, visual extinction, left central facial paresis, without ophthalmoparasia, but with a preferential look to the right. There was also a picture of anosognosia, with a NIHSS (National Institutes of Health Stroke Scale) of 7 points.

He performed electrocardiogram, which showed sinus taquichardia, 100 beats per minute, and a Head CT, which revealed no apparent ischemic or acute hemorrhagic lesions. He also performed angio-CT scan, which did not reveal the presence of endoluminal thrombosis, or other relevant changes.

Initiated thrombolysis with tissue plasminogen activator (rtPA), with door-to-needle time of 1h22 minutes. He showed improvements, moving to an NIHSS of 6.CT scan 24 hours later, showed recent occipitoparietal and thalamocapsular ischemic infarction in the cortical and perforating arterial territory of the rightMCA that obliterates the adjacent cortical grooves, (Figure 1A).

He was admitted to the Stroke Unit, diagnosed with right ischemic stroke of the right middle cerebral artery, under anti-aggregation and statin for follow up.

The etiological investigation (lipid profile, glycosylated hemoglobin, thyroid function, immunology, serology for Syphilis and HIV) and the vascularstudy (Holter ECG, neck vessels Doppler ultrasonography, transthoracic and transesophageal echocardiogram) didn't show changes or embolic source. Fabry's disease research negative.

It was also performing cranium-encephalic magnetic resonance, which confirmed ischemic injury in the right MCA territory, ((Figure 1B).

It was concluded that there was no embolic cardiac source, in fact, no arrhythmia,images suggestive of vegetation's, tumors or valvular or perivalvular abscesses were observed, as well as patent foramen oval or any other shunt.

His discharge diagnosis was ischemic stroke, presumably of vasospastic nature, dueto ephedrine Level.

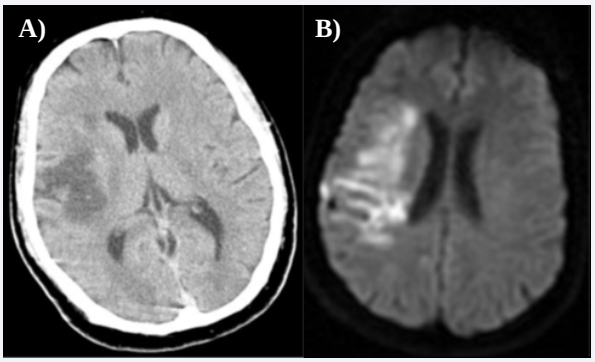

Figure 1 CT scan 24 hours (A) and cranio-encephalic magnetic resonance (B) showed recent occipitoparietal and thalamocapsular ischemic infarction.

DISCUSSION

In the case described, by the absence of risk factors for cardiovascular disease, everything points-out to a causal relationship between this diagnosis and the regular consumption of ephedrine Level, during a period of three months previously to the event. The major review article on adverse cardiovascular effects related to ephedrine identified 16 strokes, of which 75% were ischemic and 25% hemorrhagic [4]. Vasospasm may occur in the large arteries of the skull or in the small arteries in the microvasculature, and the deleterious effects of vasospasm may still be exacerbated by platelet aggregation induced by sympathomimetics, such as ephedrine [5].

Ephedrine and its alkaloids like are common components of dietary supplements, consumed by individuals looking to lose weight quickly while maintaining a high level of energy. Despite warnings from various health authorities, and being viewed as doping by most sports bodies, their consumption is indiscriminate.

Consumption of these products has been associated with cardiovascular and neurological events [3] and, since 2004; the Food and Drug Administration banned its commercialization in the USA.

Regardless of the dose, ephedrine is an active principle that stimulates the release of endogenous catecholamines, stimulating α-1, α-1 and α-2 adrenergic receptors [6,7] in the heart and blood vessels.It has been associated with cardiovascular events, namely myocardial infarction, hypertension, myocarditis and lethal arrhythmias. The mechanism of action of myocarditis and myocardial infarction are constriction of the coronary arteries and, in some cases, vasospasm. The adrenergic effects of ephedrine shorten heart's refractory periods, leading to the development of cardiac arrhythmias. Ephedrine may also predispose patients to hemorrhagic and ischemic stroke. Subarachnoid hemorrhage will result from the hypertensive action of ephedrine, which may be short, or from cerebral vasculitis, which has been described in several sympathomimetic substances. Thrombotic AVS will be related to vasoconstriction of the large cerebral arteries, which leads to local thrombosis as a result of stasis and activation of platelets induced by sympathomimetic substances [3].

This case highlights the need to educate the community about the risks associated with the consumption of dietary supplements with ephedrine and derivatives, since its consumption may precipitate life-threatening cardiovascular eventsand/or permanent disability.

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