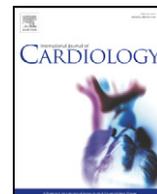




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Letter to the Editor

Reversible cardiomyopathy due to chronic use of xylometazoline topical nasal spray

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Nasal decongestants are sympathicomimetic acting drugs frequently used for topical delivery as a nasal spray [1,2]. We report a case of reversible cardiomyopathy associated to chronic use of intranasal xylometazoline.

A 56 year old male with well-controlled hypertension treated with Lisinopril 5 mg a day was admitted to the emergency department with dyspnea at rest after three weeks of exertional dyspnea. He presented chronic rhinitis with administration of xylometazoline (Otrivin©) in spray 3 to 5 times a day during 17 years. Physical examination highlighted the presence of jugular venous distension, pulmonary rales, third heart sound and bilateral pitting edema. Laboratory tests presented normal renal function and blood count with an NT-proBNP level of 2180 pg/mL. PCR and leucocytes were normal. Cardiomegaly, bilateral pleural effusion and signs of high venocapilar pressure were present in chest X-ray. ECG revealed sinus tachycardia at 110 bpm. Echocardiography showed a moderately dilated left ventricle with 0.20 ejection fraction. Right ventricle was mildly dilated and hypokinetic with 14 mm tricuspid annular plane systolic excursion (TAPSE). Coronary angiography was performed, with no epicardial lesions. Magnetic resonance imaging (MRI) confirmed a severe left ventricular dysfunction (ejection fraction 0.25) with no late enhancement and no signs suggesting myocarditis (Figs. 1 and 2).

The patient received furosemide, lisinopril, carvedilol, and spironolactone. Consequently he improved clinically and was discharged 5 days later with the recommendation to stop xylometazoline topical nasal spray.

Six months later, heart failure signs had disappeared, the patient was asymptomatic and he returned to his every day activities. The recovery of left ventricular function to near normal values (ejection fraction 0.45) was seen in the echocardiography. A year after discharge, MRI confirmed the complete recovery of the systolic function.

Nasal decongestants are sympathicomimetic acting drugs which, when administered intranasally, stimulate alpha adrenergic receptors and produce local arteriolar vasoconstriction causing possible systemic effects [1,2]. Imidazoline derivatives (oxymetazoline, naphazoline, tefazoline, xylometazoline and tetrahydrozoline) at low doses, stimulate the alpha-1 receptors in central nervous system, however, higher doses can produce peripheral effects such as hypertension, coronary and peripheral vasoconstriction, mydriasis, inhibition of insulin release, contraction of bladder sphincter and reflex bradycardia. Toxic doses can cause psychosis, hallucinations and seizures [1–3]. Previous cardiac adverse effects related to topical sympathomimetic amines have been reported, including severe outcomes as cardiac arrest, transient apical dysfunction syndrome and syncope [3–5]. There is also a case report of acute pulmonary edema in relation to oral ingestion of naphazoline [6].

The role of sympathetic nervous system activation in chronic heart failure is well established, neurohumoral hyperactivity is directly related to myocardial systolic dysfunction with activation of the renin–angiotensin–aldosterone system [7]. Sympathetic stimulation produces constant alterations in excitation–contraction coupling and stimulates apoptotic pathways. High doses of catecholamines produce calcium overload, and increase sarcolemmal permeability, interstitial fibrosis and cyclic AMP levels with oxidative damage [8]. Interestingly, studies in rat myocytes have observed that chronic stimulation of alpha-adrenergic receptors produces changes in the phenotype of contractile proteins [9] and catecholamine toxicity is probably the cause of Tako-Tsubo stress cardiomyopathy [10].

As xylometazoline topical nasal spray at high doses has systemic absorption, it is reasonable to assume that, in our patient, a chronic stimulation of alpha receptors due to high sympathomimetic amine levels was related with the appearance of systolic dysfunction. Furthermore, xylometazoline withdrawal was associated with the recovery of ventricular function. Xylometazoline is frequently used as an over-the-counter drug with high rates of dependence among users due to the significant rebound effect if the nasal spray is stopped. This self-prescription with no medical control allows patients to consume significant amounts of alpha adrenergic drugs in an unrestrained way. Our case highlights the importance of close monitoring for these patients and the need for further studies to understand the real impact of chronic use of sympathomimetic drugs in the myocardium. Moreover, a case report of ischemic stroke in a young adult after use of xylometazoline containing nasal decongestant for 10 years has been

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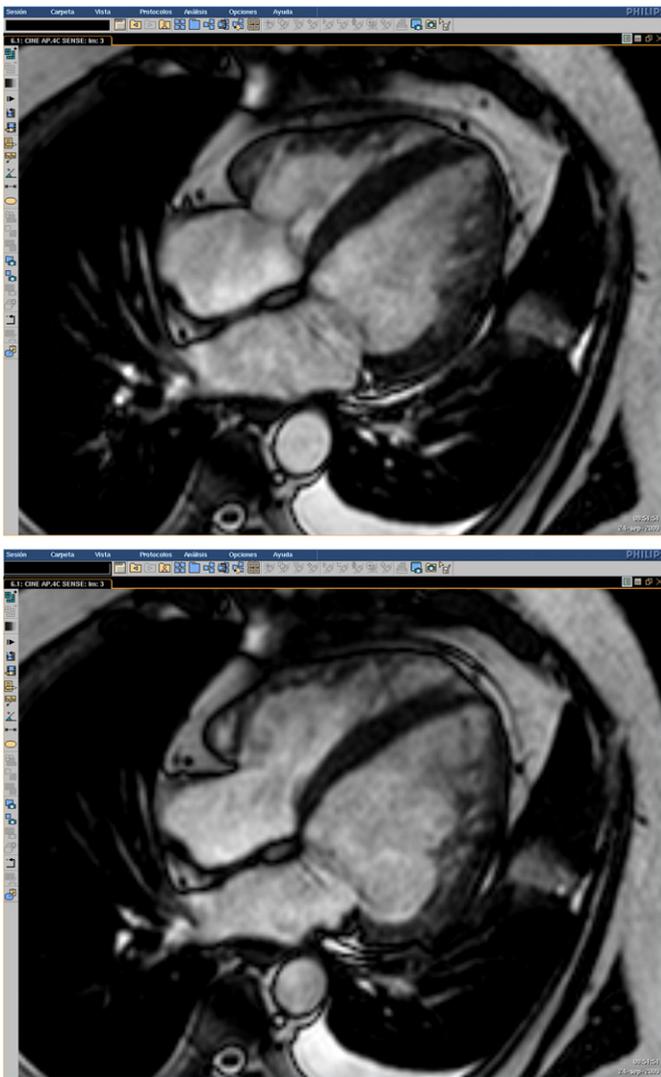


Fig. 1. MRI performed on admission, cine images obtain.

recently described [11]. Clearly, there is a need of an increase knowledge and awareness of the medical community and public about these serious complications of topical nasal sprays containing sympathomimetics.

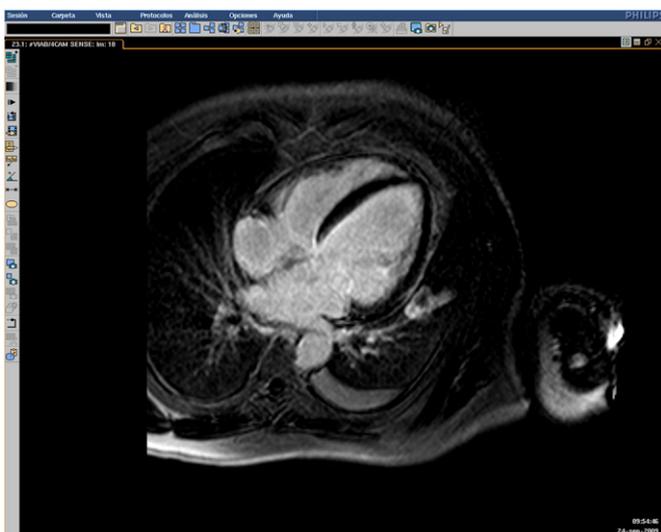


Fig. 2. MRI, late enhancement images, 4-chamber view. No enhancement.

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