Cardiomyopathy Caused by Naphazoline

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Objective
Takotsubo cardiomyopathy (TTC) is a cardiomyopathy characterized by acute reversible apical ventricular dysfunction and apical akinesis in the absence of obstructive coronary artery disease.

We describe a case of Takotsubo cardiomyopathy caused by naphazoline.

Case report
A 28 years old patient underwent septoplasty. He was prescribed postoperative 0,1 % naphazoline solution as a decongestant.

On day 11 he got a new bottle of the solution as an extemporaneous formulation. Some minutes after the first application of 2 ml the patient complaint of nausea, vomiting, sweating and reduced consciousness.

On admission in the ENT-department his heart rate was 40/min with a systolic blood pressure of 200 mmHg. It turned out that the solution erroneously contained 10 % naphazoline. The patient was treated with atropin and possibly an alpha blocking agent.

On arrival in the medical clinic he felt well and physical examination including heart rate and blood pressure was unremarkable, as was cranial CT. Labarotory work revealed slightly elevated troponin (0,68 ng/ml).

A left heart catheterisation on day 2 after admission showed slight apical hypokinesia without coronary macroangiopathy. This was interpreted as a sign of “healing takotsubo cardiomyopathy” and treatment was extended with low dose bisoprolol and ramipril.

The further course was unremarkable. Echocardiography on day 4 after admission showed normal cardiac function.

Discussion
Naphazoline is an imidazoline with agonistic properties at α1- and α2-receptors. Overdose typically provokes hypertension with reflectory bradycardia (stimulation of peripheral α1-receptors) followed after some hours by significant hypotension and sedation (α2-receptors).

Catecholaminergic stress is thought to be the main cause of TTC [1]. Other contributing factors may be coronary vasomotor abnormalities, cardiovascular risk factors, endothelial dysfunction, and co-morbidities [2].

Patients with TTC may present severe and lifethreatening symptoms. Therapy is mainly supportive. With respect to the role of catecholamines in the ethiology of TTC betablocking agents are used as soon as possible. Catecholamines should be avoided.

There are only a few reports about TTC after excessive use of nose drops [3, 4], but none concerning naphazoline.

Considering the involvement of catecholaminergic stress in TTC, it seems plausible to assume that sympathomimetics can trigger a TTC. However adrenergic receptors of the myocard are mainly β-receptors whereas naphazoline is a selective α-adrenergic agent.

Conclusion
A major factor in pathogenesis of Takotsubo Cardiomyopathy (also called broken heart syndrome, stress induced cardiomyopathy) is a catecholamine surge. Since naphazoline is an agonist on alpha receptors it seems plausible that it can cause this kind of cardiomyopathy after application of high doses. The authors found no report of this complication of naphazoline overdose in medline.

References