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## Induction of Atrial Fibrillation by Topical Use of Nasal Decongestants

**To the Editor:** In recent years, risk factors for atrial fibrillation such as obesity, arterial hypertension, and diabetes have been identified. In this context also, drugs such as  $\beta_2$ -agonists, bisphosphonates, anabolic steroids, and xanthine derivatives have been claimed to be associated with atrial fibrillation. The following report details the occurrence of atrial fibrillation in association with topical decongestants.

**Report of Cases.** A 60-year-old woman presented to our outpatient clinic because she had noticed an arrhythmic heartbeat for the preceding 5 days. She reported no continuous medication usage. Electrocardiography revealed atrial fibrillation with a heart rate of 100 beats/min. No abnormalities were noted on echocardiography and laboratory investigations. Electrical cardioversion was performed, and  $\beta$ -blocker therapy was initiated. However, 10 days later, atrial fibrillation recurred. During a second detailed inquiry, the patient reported that she had been using topical decongestants

containing tramazoline for many years to treat recurrent sinusitis. She had severe attacks of congestion despite up to 5 applications of the decongestant per day. She was advised to stop using decongestants immediately and underwent a second electrical cardioversion. After this second cardioversion, the patient has remained without a recurrence for 6 months.

Three weeks after the second cardioversion, the patient's 62-year-old husband came to our outpatient clinic with atrial fibrillation. He also had a history of severe recurrent sinusitis and used decongestants on a regular basis with excessive applications during attacks, similar to his wife. Two months before his visit to our outpatient clinic, pulmonary vein isolation had been performed at another hospital. However, atrial fibrillation recurred 2 weeks after ablation. The husband was also advised to stop using decongestants immediately, and after electrical cardioversion, he has had stable sinus rhythm.

**Discussion.** Although previous reports have revealed that topical nasal decongestant abuse can cause severe systemic effects such as ischemic stroke,<sup>1</sup> hypertension,<sup>2</sup> and reversible cardiomyopathy,<sup>3</sup> to my knowledge, these patients are the first reported cases indicating that nasal decongestant use can cause atrial fibrillation. Tramazoline is an imidazoline derivative that binds to peripheral  $\alpha$ -adrenergic and imidazoline receptors and thereby increases arterial pressure and causes complex neuroendocrine reactions.<sup>4</sup> These substances are absorbed by mucous membranes, and in pediatric patients, the potentially severe risks of toxicity are well known.<sup>5</sup>

Nasal congestion is a major health problem with an estimated incidence of 30% in the general population. Decongestants cause fast and sustained relief of symptoms. Because they are available without prescription, there is an increased risk of uncontrolled applications taken for longer periods of time

and at higher dosages than recommended. Long-term use can cause rebound congestion leading to rhinitis medicamentosa. Topical application of drugs such as  $\beta_2$ -agonists prescribed for patients with chronic obstructive pulmonary disease has already been reported to be associated with atrial fibrillation. In this scenario, however, these drugs are taken under medical supervision, whereas a high number of unreported cases of abuse must be estimated for nasal decongestants. The pulmonary vein isolation the husband underwent underlines the lack of awareness of the potential risks of these drugs by patients and doctors.

Heinrich Wieneke, MD

Elisabeth-Krankenhaus-Essen GmbH  
Essen, Germany

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## CORRECTION



In the Original Article entitled, "Exercise Capacity and Atrial Fibrillation Risk in Veterans: A Cohort Study" published in the May 2016 issue of *Mayo Clinic Proceedings* (*Mayo Clin Proc*. 2016;91(5):558-566), Figure 1 was incorrect. The Y axis should be labeled "Event-free Probability," and the legend should read "Probability of not developing atrial fibrillation according to fitness categories."

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