

Head injury and anisocoria on a cruise ship

Eilif Dahl

Department of Occupational Health, Haukeland University Hospital, the Norwegian Centre for Maritime Medicine, Bergen, Norway

ABSTRACT

A previously healthy 65-year-old female passenger presented on the 3rd day of her voyage with a small facial laceration after she fell and hit her forehead, following sudden blurred vision and dizziness. When the ship's doctor noticed that one pupil was much bigger than the other, he feared intracranial bleeding and considered helicopter evacuation.

Her symptoms had started shortly after she had removed a transdermal scopolamine patch from behind her ear. Getting scopolamine from her hands in direct contact with the eye surface caused mydriasis. To prevent it, after handling the patch, the hands and the application site should have been washed thoroughly with soap and water and dried.

Only time was needed for the dilated pupil to normalise.

(Int Marit Health 2016; 67, 3: 159–160)

Key words: head injury, anisocoria, mydriasis, anticholinergic adverse effect, scopolamine, motion sickness, maritime medicine

CASE REPORT

A previously healthy 65-year-old female passenger on a 10-day cruise presented on the 3rd day of her voyage in the ship's medical facility with a slightly oozing, 3-cm cut across her left eyebrow, requesting stitches. She had for a few hours noticed blurred vision and that her mouth was dry. Her blurred vision suddenly became worse, she felt dizzy despite calm seas, and when stepping into her bathroom, she failed to notice the raised doorstep, stumbled and fell, hitting her head against the sink. She did not faint.

At presentation she had the above-mentioned mild symptoms, but otherwise felt well and denied having even the slightest headache. Clinical and neurological examinations were normal, with one exception: Both her pupils were somewhat dilated. When the ship's doctor prepared to close her face wound, he observed – with alarm – that the left pupil was nonreactive and bigger than the right one. When asked, the patient denied having ever suspected that her pupils were unequal in size.

Recalling that anisocoria with head trauma is a classic sign of impending brain herniation, the doctor urgently called an experienced maritime-medical consultant ashore for advice regarding helicopter evacuation to the nearest

port of call with medical specialist service (neurosurgeon, neurologist or ophthalmologist?). The consultant's first question, "Anything to see behind her ears?" Puzzled, the ship's doctor looked: Nothing. Next question, "Has she taken any medication or used any remedies against motion sickness this cruise?"

Indeed she had: Fearing rough weather, she had applied a transdermal scopolamine patch behind one ear a few hours before departure from the first port. She felt fine for the next 72 hours, then removed the patch and applied a new patch right away. Several hours later she started to be bothered by dry mouth and blurred vision. She had been informed by her own physician about common side effects, so she decided to remove the patch since the sea was calm and the weather forecast excellent. Her vision got worse after the removal; she felt dizzy, fell and then ended up in the ship's doctor's office.

No helicopter was ordered, her hands and post-auricular areas were carefully cleaned, and she was released from the medical facility with strict instructions to call immediately if she got any worse. At follow-up the next day she felt "back to normal" and all clinical and neurological findings, including pupil size and light reactions, were unremarkable.

✉ Prof. Eilif Dahl, MD, MHA, PhD, Professor Dahls gate 50A, 0260 Oslo, Norway, tel:+47 95921759, e-mail: eilifdahl@hotmail.com

COMMENTS

Head injury combined with anisocoria might suggest intracranial bleeding, a condition that can quickly turn into a nightmare on a ship in a remote location with limited or no possibilities of speedy evacuation to a neurosurgical unit ashore [1]. Luckily, in this case it was false alarm.

Anisocoria, or unequal pupil sizes, is a common condition; some degree of pupil difference may be expected in at least 1 in 5 clinic patients. The varied causes have implications ranging from life-threatening to completely benign, and a clinically guided history and examination is the first step in establishing a diagnosis [2].

The reason for the enlarged and nonreactive pupil of our patient was simply scopolamine, a belladonna alkaloid that exerts anticholinergic effects [3]. She must have rubbed her eye after removing her second scopolamine patch and then scopolamine got in direct contact with the eye surface.

According to user instructions [4], one scopolamine patch should be applied to the hairless area behind one ear at least 4 hours before the antiemetic effect is required. It is formulated to deliver approximately 1 mg of scopolamine over 3 days and should then be replaced. However, in many cases the patch is not “empty” after 72 hours, so if one patch is applied just after removal of another, the patient will get a double dose within a few hours. There will then be a higher risk of anticholinergic side effects [5], colloquially described as “Blind as a bat, mad as a hatter, red as a beet, hot as Hades (or hot as a hare), dry as a bone, the bowel and bladder lose their tone, and the heart runs alone” [6].

Our patient had dry mouth and blurred vision after applying her second patch, most likely due to a temporary double drug dose. Anisocoria after removal of the second patch was the probably reason for her poorer vision and dizziness later, causing her to stumble, fall and hit her head.

To prevent mydriasis, after administration of the patch, the hands and the application site should be washed thoroughly with soap and water and dried [4]. However, if scopolamine-associated mydriasis does occur, only time is needed for the dilated pupil to normalise. In another scopolamine case, investigations not available on ships (computer tomography with angiogram and magnetic resonance imaging) were done to rule out stroke and aneurysm [3].

Seasickness is not an illness, just an uncomfortable condition, but must be taken seriously by ship’s medical staff and management. It can adversely affect alertness of watch-going officers and crew and decrease the service level of hotel staff [7]. Cruise companies want the medical staff to handle seasick passengers as emergencies, because upset clients are not likely to buy another cruise vacation if not quickly and successfully treated.

But although there are plenty of anecdotal cures for full-blown seasickness, there are hardly any treatment studies from which to draw evidence-based conclusions [7]. Preventive remedies are better researched, but preferred prophylaxes vary around the world; in fact, the drug-of-choice in one country may even be banned or not registered at all in another country [7].

Transdermal scopolamine was long ago shown to provide better protection against mild motion sickness than placebo and the widely used oral meclizine [8]. Although rare [4], scopolamine-induced confusion and hallucinations may be dangerous and frightening, particularly at sea, and that risk is the main reason for transdermal scopolamine patches not being offered on most cruise vessels. But passengers keep bringing patches on board, often without proper instructions for use, so ship’s medical staff must be familiar with all remedies against motion sickness and their side effects. Many doctors and nurses on large vessels will readily agree that side effects from seasick medication are now a bigger challenge than seasickness itself.

Anisocoria at sea is alarming, but without symptoms or signs of serious head injury the possibility of a scopolamine side effect should be considered and investigated before urgent evacuation is arranged.

CONFLICTS OF INTEREST

No financial or material support received. The author has worked as independent ship’s doctor and medical consultant for many cruise companies.

REFERENCES

(all accessed 31 August 2016)

1. Dahl E. Acute chest pain on cruise ships. *Int Marit Health* 2015; 66: 4–5.
2. Eggenberger ER. Anisocoria. Medscape Updated: 16 June 2016. <http://emedicine.medscape.com/article/1158571-overview>.
3. Chin J. Images in emergency medicine: Scopolamine-associated mydriasis. *Ann Emerg Med* 2014; 64: 684–689.
4. The U.S. National Library of Medicine (NLM). Label: Transderm Scop – scopolamine patch, extended release. DailyMed, updated 23 December 2014. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=4d705c57-fa98-46e0-97f3-38e1b0ada76b>.
5. Parrott AC. Transdermal scopolamine: Effects of single and repeated patches upon aspects of vision. *Human Psychopharmacology. Clin Experimental* 1986; 1: 109–115.
6. Wikipedia. Toxidrome. Modified on 28 May 2016 https://en.wikipedia.org/wiki/Toxidrome#cite_note-firstaid-3.
7. Wolffgram T. Treatment of seasickness. In: Chapter 20. Motion sickness. *Textbook of Maritime Medicine, 2nd edition* (editors: Schreiner A, Carter T). Norwegian Centre for Maritime Medicine, Bergen, Norway 2013. <http://textbook.ncmm.no/index.php/textbook-of-maritime-medicine/44-textbook-of-maritime-medicine/20-motion-sickness/705-treatment-of-seasickness>.
8. Dahl E, Offer-Ohlsen D, Lillevold PE, Sandvik L. Transdermal scopolamine, oral meclizine, and placebo in motion sickness. *Clin Pharmacol Ther* 1984; 36: 116–120.