

CASE REPORT

Myopic Changes in a Climber after Taking Acetazolamide and the Use of Corrective Lenses to Temporize Symptoms: A Case Report from Mount Kilimanjaro



Adam D. Hill, MD, FAWM

From the Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, NY.

When performing detailed tasks related to climbing or hiking, accurate vision is important for safety. Acetazolamide is a medication commonly used to prevent acute mountain sickness, but it has an uncommon side effect of transient myopia. Reports of this side effect are mainly associated with its use in obstetrics, where it is often prescribed in higher doses than used in acute mountain sickness prophylaxis. We describe the case of a climber taking low-dose acetazolamide who developed transient myopia. We further describe potential mechanisms of this rare side effect as well as a novel approach of field management utilizing possible materials at hand.

Key words: myopia, acetazolamide, altitude, altitude sickness, wilderness

Introduction

Acetazolamide (Diamox) is a carbonic anhydrase inhibitor with many clinical uses, including the prevention and treatment of acute mountain sickness (AMS). Dosing regimens vary greatly depending on the source one consults. The medication label¹ advises a divided daily oral dose of 500 mg to 1000 mg, while the Centers for Disease Control (CDC) Yellow Book and Wilderness Medical Society both suggest a lower twice-daily oral dose of 125 mg for prevention and 250 mg for treatment.^{2,3} Due to its use in high altitude travel, its potential side effects are important to consider in patient safety; these side effects include transient myopia. We describe a case of a climber on Mount Kilimanjaro who developed significant myopia after taking acetazolamide for AMS prevention as well as a novel approach to field management.

Case Presentation

A 35-year-old healthy woman with no significant medical history was part of a group of climbers attempting to summit Mount Kilimanjaro, Tanzania (5895 m). Of clinical

importance, she had a full eye examination by an ophthalmologist 8 months prior that was normal, with a self-reported baseline uncorrected visual acuity of 20/20 in the right eye (OD), 20/20 in the left eye (OS), and 20/20 when measured together (OU). The day prior to starting the climb (Day 1), she began taking 125 mg acetazolamide twice daily for prevention of AMS while staying in Arusha, Tanzania (1400 m), with the first dose being taken in the morning. In addition to acetazolamide, she was taking atovaquone-proguanil 250 mg/100 mg daily for malaria prophylaxis and a norgestimate-ethinyl estradiol oral contraceptive. Within 12 hours of the first dose of acetazolamide, she began noticing slight changes in her ability to focus on objects at a distance. The following morning (Day 2), she noted a significant decrease in her visual acuity with severe blurring of distant objects.

At onset of the climb (Day 2), she was having difficulty managing the terrain due to the visual changes and in the late afternoon sought the advice of a physician who was part of the climbing party. An ocular field examination found normal pupil reactivity, accommodation, conjunctiva, extraocular motor function, and peripheral vision. Tonometry or other advanced ophthalmologic testing was not available to assess for elevated intraocular pressures or papilledema. There were no focal neurologic deficits. Aside from the visual changes, a full review of systems was positive only for increased urination and occasional paresthesias to hands

Corresponding author: Adam Hill, MD, 79-01 Broadway, Dept. of Emergency Medicine, B1-127, Queens, NY 11373 (e-mail: hilla@nychhc.org).

Submitted for publication December 2015.

Accepted for publication April 2016.

and feet. A smartphone Snellen eye chart application (Eye Chart HD, Dok LLC) held at 1.25 m (4 feet, per application instructions) from the patient was used to determine a visual acuity of 20/70 OD, 20/70 OS, and 20/70 OU. This information, combined with the otherwise grossly normal examination, painless nature of symptoms, absence of additional symptoms, the patient's lack of personal or familial ophthalmologic history, and the knowledge that the patient had been taking acetazolamide, led the physician to make a diagnosis of myopia. This diagnosis was further supported when the physician was able to secure a pair of corrective eyeglasses (−2.5 diopter) from a member of the climbing party. The eyeglasses returned the patient's vision to "nearly normal," per her report. This enabled her to continue the climb without significant impairment. The patient immediately discontinued acetazolamide and was started on 2 mg dexamethasone every 6 hours for continued AMS prophylaxis. Prior to cessation of the acetazolamide on Day 2, only 4 doses had been administered.

The myopic climber received serial visual examinations by the physician during the remainder of the climb. The Table shows the trend of her visual acuity as determined by Snellen eye chart. Within 24 hours of acetazolamide cessation, she noted improvements in her vision and, although not yet at her baseline, she no longer required corrective lenses to safely negotiate the terrain. She successfully summited on Day 7, experiencing only mild AMS symptoms (headache and nausea) without recurrence of myopia or new visual disturbances. In-person follow-up 2 weeks later showed continued resolution of all symptoms and a stable visual acuity of 20/20 OD, 20/20 OS, and 20/20 OU when tested using a standard Snellen wall chart.

Discussion

Myopia, also called nearsightedness, is a condition in which images do not come into focus directly on the

retina but instead in front of it. This results in reduced visual acuity of objects at a distance. A search of PubMed reveals that medical literature regarding transient myopia related to the use of acetazolamide is limited and consists mainly of case reports from the 1950s and 1960s.^{4–7} Although it is a documented side effect listed on the package insert¹ as well as in popular medical references, such as UpToDate (UpToDate, Inc.) and Epocrates (athenahealth, Inc.), it is not one that is commonly discussed among medical experts providing care or advice to individuals utilizing the drug for prevention or treatment of AMS. There has been a case report of a trekker in Nepal experiencing visual changes while taking acetazolamide for the treatment of AMS at doses of 250 mg, but in that situation the dosage of acetazolamide was higher than described here; myopia began after the patient was at high altitude and already experiencing AMS. In that case, serial visual examinations and attempted correction with lenses did not occur.⁸

Acetazolamide is a carbonic anhydrase inhibitor within the sulfonamide drug class. It was initially used for its diuretic and gastric acid suppression properties. In the 1960s, its potential for affecting physiology at altitude became recognized and studied.⁷ It has been recommended as first line prophylaxis by the Wilderness Medical Society for prevention of AMS in doses of 125 mg orally twice a day.² Its ability to alter the body's response to altitude is not fully understood, but is believed to result from a combination of metabolic acidosis through increased bicarbonate excretion, increased minute ventilation, and blunted hypoxic pulmonary hypertension.⁹ A few of the more commonly noted side effects are paresthesias, taste alterations, and urinary frequency.¹

Transient myopia has been previously described in multiple sulfonamide medications and is believed to be due to edema of the ciliary body, but the exact mechanism of the myopia is unknown.^{10–12} The

Table. Visual acuity in relation to day of climb and time after acetazolamide cessation

Day	Right eye (OD)	Left eye (OS)	Together (OU)	Hours post-cessation
2	20/70	20/70	20/70	0
3	20/25	20/40	20/25	24
4	20/25	20/30	20/25	48
5	20/20	20/25	20/20	72
6	20/20	20/25	20/20	96
8	20/20	20/20	20/20	144
14*	20/20	20/20	20/20	–

Readings obtained using Eye Chart HD application without corrective lenses.

* Indicates reading obtained using standard Snellen wall chart.

Download English Version:

<https://daneshyari.com/en/article/2614497>

Download Persian Version:

<https://daneshyari.com/article/2614497>

[Daneshyari.com](https://daneshyari.com)