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APPROACH TO THE MANAGEMENT OF ACUTE MOUNTAINS SICKNESS BY INDIVIDUALS WITH SULFA ALLERGY*

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Abstract

The acute mountain sickness (AMS) management basis on prevention and symptomatic treatment. Additionally, as a second line therapy, acetazolamide may be used. It is of great importance, among travelers with sulfa allergy who visit altitude areas, the awareness of a contraindication to acetazolamide use in connection with the existing low risk of cross-reaction.In such individuals as a treatment of AMS alternatively dexamethasone may be concerned.The recommendation for prophylactic medications use is restricted only to some special situations. Although some reports provide lower incidence of AMS while dexamethasone use as a prophylaxis, side effects and not fully understand mechanism of the prevention cause that dexamethasone is dedicated to use only in carefully selected groups. There are few simply advices and recommendationsfor people with sulfa allergy which help to increase safety while travelling to altitude.

***Key words**: acute mountain sickness, sulfa allergy, acetazolamide, acclimatization*

Acute Mountain Sickness (AMS) occurs within 25-85% of travelers to altitude areas above 2500 meters (m.) [1]. The wide range of individuals suffering from AMS depends on many factors relevant in acclimatization process: ascent profile, rate of increasing sleeping elevation, personal sensitivity to hypoxic condition at altitude, previous episodes of mountain sickness, nourishment and hydration status. The most important role acts slowly, gradual ascent and care about the first symptoms of illness [1-4]. Sulfa allergy in general population is rare and is estimated within 3-6% [5] and can occur among tourists and climbers at high altitude. Individuals with allergy to sulfa drugs are not only at risk for type I allergic reaction (allergic shock) and other hypersensitivity reactions to antibacterial sulfonamide agents but also they may be in a higher risk of cross reactions to nonantibacterial sulfonamides. Acetazolamide, carbonic anhydrase inhibitor, is one of them [5].

Acetazolamide used to be taken into consideration in management of AMS. According to the Consensus Statement of UIAA Medical Commision vol. 2 from 2012 it is not the first line treatment anymore [4]. If an individual is suspected to have AMS following steps to prevent progress and resolve symptoms of the sickness must be undertaken: stay at the same altitude (rest day), avoid any workload, drink enough in spite of nausea and begin oral symptomatic therapy: in case of nausea – antiemetics, in case of headache – painkillers. Acetazolamide may be considered if the symptomatic treatment fails after 6-12 hours. If symptoms do not improve or worsen within 24 hours descent should be initiated [4].

Among tourist at high altitude it is a common attempt to speed up the acclimatization process by drug use, unfortunately, not rare in a wrong way. The recommendation for prophylactic medications use is restricted only to some special situations, especially when a fast ascent cannot be avoided for any reason - airport of destination at high altitude, rescue operations [4,6,7]. In moderate – to high-risk situations of AMS such as prior history of AMS and climbing over 2500-2800 m in 1 day, rapid ascent above 2800-3500 m and increase in sleeping elevation more than 500 m/24 hours above 3000 m, a prior history of high altitude pulmonary edema (HAPE) or high altitude cerebral edema (HACE) pharmacological prophylaxis may be considered as an addition to gradual ascent [4,6]. Usually it is recommended to use 500 mg/day of acetazolamide. Because of the side effects such as paresthesias or mild diuresis management a smaller dose 250 mg/day can be effective as well [4,6,8-10].

By individuals with sulfa allergy acetazolamide is contraindicated in connection with the existing low risk of cross-reaction [5-7]. Although, it has not been found convincing evidence of broad cross-reactivity between antibacterial and non-antibacterial sulfonamide agents [5], some case reports describe anaphylactic reaction to oral administration of acetazolamide in patient with sulfa allergy [11-12]. As long as an individual is suspected to suffer from symptoms of AMS in a remote mountain area and has history of any kind of hypersensitivity to sulfa drug, acetazolamide should not be used. In such situation dexamethasone may be concerned as a very effective agent in the treatment of AMS [4,7,13-15]. The medication does not facilitate acclimatization [6-7] therefore further ascent should be delayed until patient is free from symptoms. Finally, when dexamethasone is discontinued rebound effect and recurrence of acute

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mountain sickness is possible [6-7]. Dexamethasone in prophylaxis as an alternative to acetazolamide [16-17] by individuals with sulfa allergy should be carefully used. Climbing with drug support without symptoms and sudden cessation of dexamethasone use can lead to severe symptoms of acute mountain sickness not present while receiving medication [6-7]. Although some reports provide lower incidence of AMS while dexamethasone use as prophylaxis, the side effects and not fully understand mechanism of the prevention mean that it should be use only in carefully selected groups [6-7,15-16].

However, it seems to be an easy way to avoid symptoms of AMS by pharmacological support, it must be noted that medications have side effects and can be life threatening when are administered in incorrect way. Nothing can replace proper acclimatization such as slowly, gradual ascent, adequate diet, and proper increasing altitude. Above 2500-3000 m sleeping altitude should not be increased more than 300-500 altitude meters every 24 hours. One extra night should be spend at the same altitude every third day of climbing. Climbers shall not sleep at the highest point reached on that day [4].

To summarize, treatment of the acute mountain sickness in individuals with sulfa allergy in the light of Consensus Statement UIAA vol. 2 from 2012 [4] does not differ from treatment individuals without sulfa allergy, except for contraindication to acetazolamide use. Sulfa allergy appears to be a problem only by those who are not aware of it. By such individuals treatment of acute mountain sickness with acetazolamide while climbing in a remote mountains area can be highly risky. Those with not clear history of sulfa allergy before planning the altitude climbing should undergo a supervised clinical trial to exclude hypersensitivity to acetazolamide [6-7,18]. In the first aid kit it is suggested to people with sulfa allergy to have dexamethasone, but it should not be used regularly to increase altitude tolerance. Even if individual decides to prophylactic dexamethasone use must be aware that it does not improve acclimatization but only reduce symptoms which can recur when drug intake is ceased [6-7,16-17]. All individuals with prior history of sulfa allergy planning a high altitude climbing should have a medical talk a few months earlier regarding risk stratification and ability to cope with health problems in the field.

Declaration of interest

The author reports no conflict of interests.

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Authors' contribution
A – Study Design
B – Data Collection
C – Statistical Analysis
D – Data Interpretation
E – Manuscript Preparation
F – Literature Search
G – Funds Collection