

The Association Between Body Composition and Acute Mountain Sickness

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Acute Mountain Sickness (AMS) is a syndrome characterized by headache, nausea and difficulty sleeping that occurs upon rapid ascent from low to high altitude. There is some evidence that obesity might be associated with the development of AMS, yet this has not been extensively studied in the field.

PURPOSE: To examine the association between body composition and the development of AMS during a high altitude hike. **METHODS:** Undergraduate students enrolled in a study abroad to Peru that included a hike on the Inca trail. Prior to traveling, total body composition was measured in all students using Dual-energy X-Ray absorptiometry (DXA). Within 24 hours of arriving in Cusco, Peru (3400 meters), the students began a 7-hour ascent to an altitude of 4100 meters, followed by a 2-hour descent to 3550 meters. AMS symptoms were assessed at 3400, 4100, 3550 meters using the Lake Louise self-report questionnaire. A score of 3 to 5 was defined as mild, while a score of 6 or more was considered severe AMS. **RESULTS:** Fourteen students (age 21 ± 2 years; W: 11, M: 3) completed the trek. Total body fat of women was higher compared to men (W: $32 \pm 5\%$ vs. M: $21 \pm 4\%$, $p=0.01$), yet no differences in self-reported AMS symptoms were observed at any point between genders. The number of students exhibiting AMS increased from 8 (mild: 4, severe: 4) at 3400 meters to 10 (mild: 6, severe: 4) at 3550 meters. Across both genders, higher trunk fat was related to higher AMS scores ($r=0.54$, $p=0.04$) at 4100 meters. **CONCLUSION:** Our findings suggest that obesity may be an important factor in the development of AMS. Thus, obese persons traveling to high altitude should consider specific prophylactic measures to reduce the risk of this syndrome.