Selected Abstracts From the Wilderness Medical Society's 2014 Winter Scientific Conference

Walk High, Sleep Low: An Observational Cohort Study of Altitude Symptoms and Physiological Profiles Over a 6 Day Ascent of Mount Kilimanjaro

Introduction.—Acute mountain sickness (AMS) is a potentially life threatening complication of high altitude trekking. Several ascent profiles of Mount Kilimanjaro have been criticized for rapid ascent allowing little acclimatization time. The 7 day Lemosho route is one of the longest treks, allowing 2 days for acclimatization (day 3 & 4) and more time for rest which should improve the success rate of trekkers reaching the summit as well as decreasing the incidence of potentially fatal complications of AMS such as high altitude cerebral edema (HACE).

Objective.—To evaluate symptom profiles of trekkers on Lemosho route to determine whether this route enhances acclimatization.

Methods.—Daily measurement of oxygen saturation, heart rate, and Lake Louise Symptom Score (LLSS), plus clinical assessment score (CAS) recorded days 1–4, summit day for 25 subjects.

Results.—Median LLSS + CAS day 1 = 0.56, incidence of AMS 4% ; median LLSS + CAS day 2 = 2.24, incidence of AMS 40%; median LLSS + CAS day 3 = 1.72, incidence of AMS 36%; median LLSS + CAS day 5 = 1.84 incidence of AMS 24%; median LLSS + CAS summit day = 2.4 incidence of AMS 40%. Incidence of AMS/HAPE in smokers (12%; $n = 3$) = 0; incidence of AMS/HAPE in non-smokers (88%; $n = 24$) = 48% ($n = 12$); incidence of AMS/HAPE without acetazolamide (24%; $n = 6$) = 8% ($n = 2$); incidence of AMS/HAPE with acetazolamide (76%; $n = 19$) = 10.

Conclusions.—Incidence of AMS has been reported to range between 47 and 75% on Mount Kilimanjaro. Our results show a significantly lower rate with symptom scores and heart rate highest at day 2 but improved following the subsequent acclimatization day demonstrating benefits of the longer route and the value of time to acclimatize.

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altitude by ultrasound measurements and correlate this with summit success (SS).

Methods.—A prospective observational cohort study enrolled climbers between the ages of 18 and 65 who had been at 14,000 ft (4267 m) for less than 24 hours on Mount McKinley, Alaska during June 2013. Participants completed a survey about water-carrying capacity and intake and had state of hydration evaluation determined by urine specific gravity (SG) and ultrasound measurements of the inferior vena cava (IVC) collapsibility index. Upon returning to 14,000 ft after their summit attempt, climbers reported maximum elevation gained. An independent two-sample *t* test was performed for independent variables with binary logistic regression for the identified significant predictors.

Results.—One-hundred twenty-one participants enrolled, with 100 (86%) complete data sets and 67% successful summiters. There was no significant association with SS and IVC collapsibility (50.4% vs 52.4% $\pm$ 1.9%, $P = .52$), IVC size (0.96 cm vs 0.99 cm $\pm$ 0.03 cm, $P = .63$), or SG (1.02 vs 1.02 $\pm$ 0.001, $P = .64$). Successful summiters estimated they consumed more water (3.4 L/day vs 3 L/day $\pm$ 0.4 L/day, $P = .049$) than non-summiters, though this significance was not seen in the regression analysis.

Conclusions.—Ultrasound measurements did not appear to have a diagnostic role in predicting dehydration or high-altitude performance by summit success. While ultrasound measurements indicated that climbers were dehydrated, specific gravity measurements suggested climbers were euvoletic (average SG 1.02). A trend was seen that greater water consumption might have increased chances for SS. Increasing water-carrying capacity is an inexpensive and easy intervention that may improve SS in climbers ascending to high altitudes.

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Hydration Status as Predictor of Summit Success on Mount McKinley

Background.—As thousands of people attempt high-altitude peaks each year, euhydration is promoted for optimal climbing performance and dehydration is viewed as a potential detriment. This study was the first to define hydration status at high

Incidence of Illness and Sick-Cell Trait at Altitude: Data from the Marine Mountain Warfare Training Center

Introduction.—Sickle-cell trait (SCT) has been associated with an increased risk of injury and death among otherwise