

PREDICTION OF THE SUSCEPTIBILITY TO ACUTE MOUNTAIN SICKNESS BY SAO₂ VALUES DURING SHORT-TERM EXPOSURE TO HYPOXIA

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Prediction of the development of acute mountain sickness (AMS) in individuals going to high altitudes is still matter of debate. Whereas some studies found that subjects with a blunted hypoxic ventilatory response are predisposed to AMS others did not. On the one hand, much of the contrary may be explained by the fact that AMS development depends on various factors like altitude, rate of ascent, pre-acclimatization, physical activity, general state of health, and individual susceptibility. On the other hand, the hypoxic ventilatory response has been usually determined under isocapnic conditions. However, high altitude conditions are hypocapnic and therefore the hypocapnic hypoxic ventilatory response or simply the arterial oxygen saturation (SaO₂) during acute exposure to hypoxia may be more adequate for prediction of AMS susceptibility. Thus, the study goal was to evaluate the relationship between individual SaO₂ values during acute hypoxia and AMS susceptibility.

132 healthy male and female mountaineers (age: 18 – 79 years) with known susceptibility to AMS were exposed to various degrees of normobaric and hypobaric (passive ascent) hypoxia. SaO₂ values (1-minute averages) were taken by finger pulse-oximetry after 20 – 30 min of hypoxic exposure. Study participants had no high-altitude exposure >2500 m for at least 1 month and performed no exhaustive exercise within 3 days prior to the experiment.

SaO₂ values during exposure to hypoxia (simulated and real altitudes) are shown in figure 1 for individuals with and without susceptibility to AMS.

Based on a model derived by logistic regression AMS susceptibility has been correctly predicted in 85 % of individuals exposed to short-term hypoxia. No differences between males and females or normobaric and hypobaric hypoxia could be detected. Beside slight dizziness at higher altitudes no complaints were reported during the hypoxic exposures.

In conclusion, SaO₂ values during short-term exposure to normobaric and hypobaric hypoxia represent good predictors for AMS susceptibility.

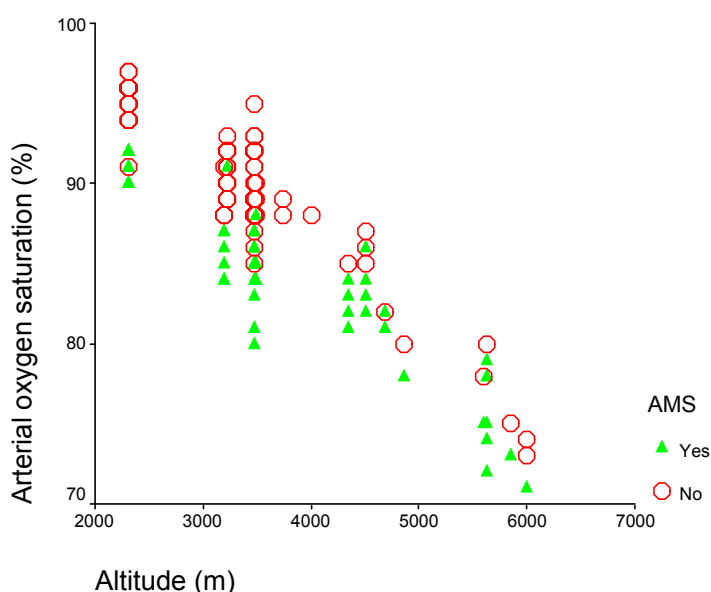


Fig. 1: Arterial oxygen saturation during short-term exposure to normobaric or hypobaric hypoxia (corresponding altitudes are shown) for individuals with and without AMS susceptibility.