PREDICTION OF ACUTE MOUNTAIN SICKNESS BY MONITORING ARTERIAL OXYGEN SATURATION DURING ASCENT

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INTRODUCTION
Climbing at over 2500 m altitude requires adaptation and acclimatisation to both lower air pressure and diminished partial pressure of oxygen. If the adaptation process fails, a condition referred to as acute mountain sickness (AMS) may occur. AMS is a self-limiting syndrome, which usually resolves in 1-2 d. If symptoms are neglected, AMS may progress rapidly and may even have fatal results (1). Arterial oxygen saturation at rest (RSpO2) has been offered as simple indicators of inadequate acclimatisation to high altitudes and impending AMS (2). The aim of this study was to investigate if post-exercise oxygen saturation (ExSpO2) is more indicative of AMS than RSpO2.

METHODS
The study was conducted during six expeditions with a total of 61 subjects, (mean (SD) age 32 (6.5)y and V0max 57 (8.5) ml/kg/min). Expeditions climbed from 1200 m to 4300 m in 4-9 days. Adaptation of the study subjects to altitude was evaluated by measuring SpO2 at rest and after moderate exercise (50 m walking, target heart rate 150 bpm) at different altitudes. The Lake Louise questionnaire was used for the diagnosis of AMS.

RESULTS
Prevalence of AMS was 44 % (27/61) in the whole study group. RSpO2 and ExSpO2 was measured in all climbers at altitudes 3500 m and 4300 m. The difference between AMS group (n=27) and Non-AMS group (n=34) in both RSpO2 (79% vs. 86%) and ExSpO2 (72% vs. 80%) was significant (p< 0.0001) at the altitude of 4300 m. Impending AMS in the group that got AMS in 4300 m was seen also in 3500 m altitude where difference between AMS and Non AMS in RSpO2 (88% vs. 90%, p<0.04) and ExSpO2 (81% vs. 85%, p<0.02) was significant.

DISCUSSION
The results suggest that reduced ExSpO2 at the end of 50 m walking may be more indicative and predictive of acclimatization problems than RSpO2 alone. The test of ExSpO2 can be quite easily standardized even in extreme field conditions and may help to pick up those climbers who are in risk to get AMS.

REFERENCES

Keywords: Adaptation, Altitude, Climbing/Mountaineering