

Name of research institute or organization:

Pneumology, Medizinische Klinik, University of Munich

Title of project:

Changes of impulse oscillometric parameters in healthy people after exposure to high altitude

Project leader and team:

Dr. med. Rainald Fischer, project leader

Project description:

It has been shown that interstitial lung edema evolves in healthy subjects acutely exposed to altitudes above 4500 m. However, it is not known whether these changes occur also at lower altitudes.

The goal of our study was to monitor peripheral lung function changes by measuring resistance and reactance at different frequencies with impulse oscillometry.

In 44 healthy, non-smoking subjects, baseline measurements (flow-volume-loop, impulse oscillometry) were obtained at Grindelwald (943 m) before exposure to high altitude at Jungfraujoch (3454 m). After 6 h (T1) and 18 h (T2) at high altitude, measurements were repeated.

We found a significant reduction of vital capacity (mean delta 105 ml, $p=0.11$), reactance at 5 Hz (mean delta 0.01, $p=0.001$) and low frequency reactance area (AX, mean delta -0,157, $p<0.00$). AX remained elevated at T2, however, a trend to a return to baseline could be observed.

We were therefore able to demonstrate a significant reduction in low frequency reactance in healthy subject after acute exposure to high altitude. As FEV1 and MEF25 were not significantly changed, this alterations can be explained by an increase of interstitial or alveolar lung water due to higher pulmonary pressure and reduced alveolar water clearance.

Key words:

Lung function, altitude, high altitude pulmonary edema

Internet data bases:

www.bexmed.de

Collaborating partners/networks:

German society of mountain and expedition medicine

Scientific publications and public outreach 2006:

Refereed journal articles

Bergner A, Kellner J, Kemp da Silva A, Fischer R, Gamarra F, Huber RM. Bronchial hyperreactivity is correlated with increased baseline airway tone. *Eur J Med Res* Feb;21(11):77-84. 2006

Conference papers

W. Loy, R. Fischer, A. Muehlfeldner, A. Bergner, R. M. Huber (High altitude study group, Pneumology, University of Munich, Germany). Comparison of two acclimatisation schedules in healthy young subjects. ERS Hypoxia Conference, March 2006, Taormina.

W. Loy, R. Fischer, A. Muehlfeldner, A. Bergner, R. M. Huber (High altitude study group, Pneumology, University of Munich, Germany). Sustained increase of cardiopulmonary exercise capacity after one week of hypobaric hypoxia (2650m) in patients with metabolic syndrome. ERS Lung Science Conference, March 2006, Taormina.

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