

Name of research institute or organization:

Pneumology, Medizinische Klinik Innenstadt, University of Munich

Title of project:

Change of peripheral lung function parameters in healthy subject acutely exposed to 3454 m

Project leader and team:

Dr. med. Rainald Fischer

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 22 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 0.016, $p=0.001$) and low frequency reactance area (AX, mean delta -16.5, $p<0.00$). All three parameters returned to baseline values after the first night at altitude (T2).

We were therefore able to demonstrate a significant reduction in vital capacity and 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 2005:

Fischer, R., Lang, SM, Bergner, A., Huber, RM. Monitoring of expiratory flow rates and lung volumes during a high altitude expedition. *Eur J Med Res.* **16**, 469-74, 2005

Fischer, R. Hazards of mountain climbing and hiking. *MMW Fortschr Med.* **22**, 28-30, 32. 2005

Fischer, R, Lang SM, Bruckner K, Hoyer HX, Meyer S, Griese M, Huber RM. Lung function in adults with cystic fibrosis at altitude: impact on air travel. *Eur Respir J.* **25**, 718-24. 2005

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