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## Increased net water loss by oral compared to nasal expiration in healthy subjects.

[Svensson S](#), [Olin AC](#), [Hellgren J](#).

Department of Occupational and Environmental Medicine, Sahlgrenska University Hospital, Göteborg, Sweden.

**AIM OF THE STUDY:** To compare the difference in respiratory water loss during expiration through the nose and through the mouth, in healthy subjects. **METHODS:** The study included 19 healthy, non-smoking volunteers without any present history of non-infectious rhinitis, presenting with symptoms of rhinitis, asthma or previous nasal surgery. Nasal and oral expiratory breath condensates were collected using a breath condenser during tidal respiration at indoor resting conditions. During the nasal breath condensate sampling, the subjects were breathing into a transparent face mask covering the nose and the mouth with the mouth closed. During the oral breath condensate sampling, the subjects inhaled through the nose and exhaled through a mouthpiece connected to the condenser. The airflow during the sampling was assessed with a dry-spirometer connected to the condenser. Sampling was stopped after 100 litres of expired air for each breathing mode. Nasal sampling was done before and after decongestion of the nasal mucosa with oxymetazoline, 0.5 mg/ml. The effect on the nasal mucosa was assessed with acoustic rhinometry. **RESULTS:** The mean loss of expired water was 42% less by nasal expiration before decongestion than by oral expiration ( $1.9 \times 10^{-3}$  g/L min compared to  $2.7 \times 10^{-3}$  g/L min,  $p < 0.001$ ). The mean expiratory minute ventilation was 9.0 L/min by nasal respiration and 9.8 L/min by oral respiration. Decongestion of the nasal mucosa showed a mean increase of the cross-sectional area at 4 cm from the nostril (1.44 to 1.67 cm<sup>2</sup>,  $p = 0.0024$ ), but there was no effect on the net water loss ( $1.9 \times 10^{-3}$  g/Lmin vs  $1.9 \times 10^{-3}$  g/Lmin). **CONCLUSION:** This study showed that the net water loss increased by 42% when the breathing mode was switched from nasal to oral expiration during tidal breathing in healthy subjects. Increased water and energy loss by oral breathing could be a contributing factor to the symptoms seen in patients suffering from nasal obstruction.

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