

A Summary of:

Continuous Nasal Positive Airway Pressure (nasal CPAP) with a Mouth Leak: Effect on Nasal Mucosal Blood Flux and Nasal Geometry

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TAKE HOME POINTS

- Mouth leak during CPAP causes unidirectional nasal airflow.
- Nasal CPAP without a mouth leak does not change nasal mucosal blood flux.
- When mouth leak is simulated during nasal CPAP there was a 65% increase in nasal mucosal blood flux comparative to that measured prior to CPAP.
- Adding a heated humidifier to the CPAP circuit prevented the increase in nasal mucosal blood flux that was previously seen during mouth leak.
- There was no change in nasal geometry regardless of whether or not the CPAP air was humidified.

AIM

To determine if nasal CPAP with a mouth leak and the resulting unidirectional airflow would increase nasal mucosal blood flux and decrease nasal volume and minimal cross sectional area.

To determine if these changes could be prevented by humidifying the air inspired with nasal CPAP.

METHOD

Eight normal subjects were recruited. Initially they measured nasal mucosal blood flux, minimal cross sectional area and nasal volume, for every subject.

Subjects were then put on CPAP and asked to simulate a mouth leak. The experiment was stopped when 500 litres had been expired through the mouth. Following the administration of nasal CPAP nasal mucosal blood flux, minimal cross sectional area and nasal volume were again measured.

This procedure was repeated the following day using a heated humidifier in conjunction with the CPAP unit.

RESULTS

Measurements of nasal mucosal blood flux and minimal cross sectional area did not differ on either day prior to CPAP use. However, on the second day prior to the use of heated humidification and CPAP, nasal volume was significantly decreased comparative to the previous day.

When subjects' measurements were taken following CPAP without a mouth leak no significant differences were seen.

Following the administration of nasal CPAP with a mouth leak there was a significant increase (65%) in nasal

mucosal blood flux ($p < 0.0001$). There was also an observed decrease in nasal volume (although this did not reach significance).

After humidified nasal CPAP there was no significantly apparent increase in nasal mucosal blood flux following the period of mouth leak. This suggests that humidification prevented the increase previously produced by mouth leak.

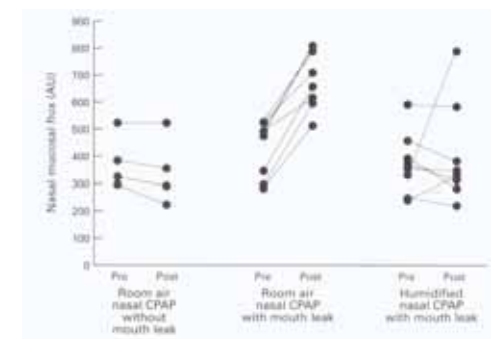


Figure 1: Nasal mucosal blood flux with and without mouth leak before and after nasal CPAP

CONCLUSIONS

Nasal CPAP used with an open mouth leads to unidirectional airflow causing an increase in nasal mucosal blood flux. Humidifying the air inspired with nasal CPAP can prevent this increase.

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