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Title: The impact of hypertonic saline inhalation on nasal nitric oxide levels and mucociliary clearance

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Body: Introduction and aims: Nitric oxide (NO) has an influence on airway physiology by mediation in ciliary activity and mucociliary clearance (MCC), inflammation, host defense, bronchial tone and pulmonary vascular resistance. The aim of our study was to establish the relation between nasal nitric oxide levels (nNO) and mucociliary clearance and the impact of hypertonic saline inhalation on these markers what was never established before. Methods: We examined 43 subjects. nNO was measured in right (RnNO) and left (LnNO) nostril before and after inhalation of hypertonic saline (HS) using analyzer NIOX. MCC was measured before and after inhalation of HS by saccharin test. Results: The levels of nNO before inhalation of HS (RnNO 806 ppb, IQR-337.6; LnNO 854 ppb, IQR 295.8) were significantly lower than levels after inhalation (RnNO 841.8 ppb, IQR 342.3; LnNO 897.4ppb, IQR 304.1) ($p < 0.05$, Wilcoxon T-test). The difference between RnNO and LnNO before and after inhalation of HS was not statistically significant. The difference in MCC before inhalation (507 s, IQR 233), and after inhalation of aerosol (360 s, IQR 238) was also statistically significant ($p < 0.0001$, Wilcoxon T-test). We did not confirm correlation between nNO and MCC.

Conclusion: An increase in osmolarity of the airway surface increases MCC and nNO, what could help to clear accumulated secretions in the airways and prevent respiratory tract infections.