Oral care product flavors may prevent respiratory tract infections by promoting airway mucosal clearance

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Objectives: Oral care is important for maintaining oral health but has also been reported to prevent aspiration pneumonia and influenza. Airway epithelial cells play a primary defense mechanism role against respiratory tract infections, i.e., foreign matter is carried out of the airway with mucus by the rotational movement of the cilia. This cilia movement changes by directly sensing the inhalation of various compounds. Since flavors volatilize in the oral cavity and induce sensations in the brain via the olfactory receptors, we investigated the effects of flavor components of oral care products on airway mucosal clearance.

Methods: Fifty-five flavor components of oral care products, applied via the air phase, were screened with the criterion of enhancing the effect of ciliary beat frequency (CBF) on the mucosa of rabbit tracheal tissue culture. Additionally, natural essential oils containing selected flavor components were evaluated based on the mucociliary transportation rate (MCTR) of plastic particles.

Results: Some essential oil ingredients increased CBF, such as menthol, carvone, and cineole. While comparing the components reported to stimulate intracellular c-AMP, we discovered only the components that stimulate intracellular c-AMP showed a CBF-increasing effect. Natural essential oils containing the above ingredients also increased CBF. Moreover, natural essential oils containing selected flavors increased MCTR.

Conclusions: These results suggest that the flavors in oral care products provide a comfortable sensation and increase CBF of ciliated epithelial cells by increasing intracellular c-AMP and reducing the risk of respiratory tract infections.

Keywords: flavor, mucociliary clearance, airway infection, self-care, oral care products