16 - Miscellaneous

PO-036 - (23829) - OLFACTORY STIMULATION INCREASES ORAL BIOENERGETICS THROUGH IMPROVING ORAL MICROBIOTA AND ENHANCING NRF2/HO-1 ANTI-OXIDATIVE SIGNALING ACTIVITY

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None.
Oral microbiota is the second largest microbial community in human body. Maintaining eubiosis of the oral microbiota will not only supports oral health, but also contributes to the development of overall well-being. Concerning olfactory stimulation (OS) possess significant microbial modulating and anti-oxidative effects, present study aims to determine whether OS would successfully improve oral microbiota, depress oxidative stress, and subsequently benefits the state of oral bioenergetics.
Adult male Wistar rats underwent OS by inhaling the essential oil of *Origanum vulgare* dispersed by a nebulizer diffuser twice daily for two weeks, with each session lasting for 2hs., were used in this study.
Data from 16S rRNA sequencing revealed that OS effectively improves the oral microbial composition, as indicated by increased richness and diversity. Immunoblotted results also showed that OS significantly enhanced Nrf2/HO-1 signaling pathway, and consequently up-regulates the activities of several downstream anti-oxidative enzymes. Bioenergetic data corresponded well with both microbial and biochemical findings in which considerably higher cytochrome oxidase expression, Na^+/K^+ ATPase activity, and intracellular Ca^{2+} intensity were all detected in the mastication muscles of OS rats compared to that of untreated ones. Morphological data from scanning electron microscopy further showed that the averaged trabecular thickness of alveolar bone were much higher in OS rats than in untreated ones.
As OS successfully improve oral microbiota, enhance anti-oxidative activity, increase bioenergetics of mastication muscle, and strengthen bony structure of alveolar bone, applying OS may serve as a promising strategy to preserve oral function or to counteract the pathogenesis of oral diseases.

Palavras-chave : Oral microbiota, Olfactory stimulation, Bioenergetics