

Manipulating Oral Microbiome, a Gateway to Good Health: An Approach

Rajesh Sawhney*

Professor and Head, Department of Microbiology, National Dental College and Hospital, Derabassi, Punjab, India

***Corresponding Author:** Rajesh Sawhney, Professor and Head, Department of Microbiology, National Dental College and Hospital, Derabassi, Punjab, India.

Received: November 02, 2024; **Published:** November 26, 2024

Abstract

Oral microbiome has been reported to have significant role in health promotion. Oral microbiome manipulation could be a plausible tool to harness its beneficial effects. An insight into the current approaches to oral microbiome and its possible permissible manipulations could be a gateway to good health.

Keywords: *Oral Microbiome; Health Promotion; Microbial Implant*

Introduction

Oral microbiome refers to the microbial flora of human oral cavity. Both the hard as well as soft tissue surfaces of the oral cavity act as safe adhesive niches for the diverse microbial communities to colonize and flourish in the given environment [1,2]. The miniatures tend to reside there as commensals or pathogens in their planktonic or biofilm mode. These microbial formations by bacteria, fungi and viruses have been seen to either initiate infectious lesions in the oral cavity or act as focus of infection to be disseminated to other parts of the body. Contrary to this, oral microbiome has also been reported to have significant role in maintaining oral homeostasis, protection from disease development and health promotion [3]. Thus, tackling the oral microbiome in a judicious way could be thought of a plausible tool to curb the deleterious effects and harness the beneficial effects of such a diverse microbial community present or artificially implanted in the oral cavity. The present text attempts to highlight the current approach to oral microbiome and possible manipulations.

Oral microbiome: Current understanding

To date it is well understood that the oral cavity of the newborn is generally sterile and that the process of microbiome acquisition commences with the debut feeding by the newborn [4]. Thereafter, the oral environment is said to exhibit remarkable age or oral anatomy dependent dynamism with respect to the establishment of early colonizers and further microbial succession. For example, the oral cavity of the old age people after shedding of teeth has been reported to possess similar microflora as that of the children before eruption of their tooth [5]. The oral microbiome dynamics might depend on host diet, oral hygiene, alteration in pH, microbial interactions, gene mutations and gene transfers, which in turn might affect the physiological, metabolic and immunological functions of the host body [6,7]. In a bid to curb the nuisance by the colonizers of the oral cavity, consistent efforts are being made to understand the oral biofilm mechanistic tools useful in microbial colonization, virulence, dispersal and control.

Oral microbiome: Newer approaches

Newer approaches for health promotion through microbial manipulations have been underway since long. A large number of methods viz. maintaining oral hygiene, use of synthetic and natural mouth rinses, mineral oils, antibiotic therapeutics, anti bioadhesive surfaces etc. have been employed and are still being researched for their efficacy against microbial nuisance in the oral cavity. The studies have revealed the microbial dynamics and time dependent shifts of oral microflora such as microbial seeding in the oral cavity after birth, invasion by aerobes in the first year, pre and post tooth eruption colonization and microflora after tooth shedding etc. [4,5,8,9]. This relevant science could be applied possibly at similar or coinciding stages by seeding beneficial microbiome in the oral cavity of newborns as early colonizers and time to time supplementing with competitive microbial flora. This could be thought of a presumptive step towards oral microbiome manipulation. This could trigger forced commensalism in the oral cavity with its beneficial impact in oral ecosystem. Hopefully, such a microbiome could act as colonization factor to keep away newer harmful microorganisms. Moreover, careful screening of the microbial flora for their beneficial traits such as synthesis of desired vitamins or other such metabolic products or byproducts which are health promoting factors for the humans could evolve a promising microbial implant. Such an implant could be a gateway to good health. Another elaboration regarding lowest beta diversities in the oral sites among different individuals suggest presence of relatively similar organisms in oral sites of different individuals [10]. This indicates that owing to the matching affinities of organisms to the oral niches; similar set of organisms could be easily implanted over larger population sizes.

Conclusion

In-depth studies on implanting beneficial microflora in the oral cavity at different stages of life could be thought of a promising tool and strategy to a good health.

Bibliography

1. Zaura E., *et al.* "Acquiring and maintaining a normal oral microbiome: Current perspective". *Frontiers in Cellular and Infection Microbiology* 4 (2014): 85.
2. Dewhirst FE., *et al.* "The human oral microbiome". *Journal of Bacteriology* 192.19 (2010): 5002-5017.
3. Deo PN and Deshmukh R. "Oral microbiome: Unveiling the fundamentals". *Journal of Oral and Maxillofacial Pathology* 23.1 (2019): 122-128.
4. Marsh PD. "Role of the oral microflora in health". *Microbial Ecology in Health and Disease* 12.3 (2009): 130-137.
5. Patil S., *et al.* "Oral microbial flora in health". *World Journal of Dentistry* 4.4 (2013): 262-266.
6. McLean JS. "Advancements toward a systems level understanding of the human oral microbiome". *Frontiers in Cellular and Infection Microbiology* 4 (2014): 98.
7. Kilian M., *et al.* "The oral microbiome - An update for oral healthcare professionals". *British Dental Journal* 221.10 (2016): 657-666.
8. Batabyal B., *et al.* "Role of the oral microflora in human population: A brief review". *International Journal of Pharmacy and Life Sciences* 3 (2012): 2220-2227.
9. Sowmya Y. "A review on the human oral microflora". *Research and Reviews* 4 (2016): 1-5.
10. Moon HJ. "Probing the diversity of healthy oral microbiome with bioinformatics approaches". *BMB Reports* 49.12 (2016): 662-670.

Volume 23 Issue 12 November 2024

©All rights reserved by Rajesh Sawhney.