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EDITORIAL

Role of probiotics in periodontal health and disease

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Scaling and root planing (SRP) continues to be the keystone of periodontal therapy [1]; though, a few microorganisms such as Aggregatibacter actinomycetemcomitans and Porphyromonas gingivalis (Pg) can enter deeper into the host tissues with the help of virulence factors they acquire. Hence, sometimes systemic antimicrobials are prescribed after SRP to prevent organisms from gaining entry. This mode of treating periodontitis has its limitations, such as development of drug resistance. Furthermore, there is a change in the microflora from a symbiotic to a dysbiotic state, and side effects like gastric disturbances on prolonged use of antibiotics. To deal with these shortcomings, local drug delivery (LDD) into the periodontal pockets is now encouraged [2]. Probiotics have become of importance to researchers in current times. As a result of resistance to an array of antibiotics by a variety of significant pathogens has raised the likelihood of alternatives to standard mechanical and chemical measures. Patients with greater susceptibility to gingivitis are recommended to use chemical agents to control bacterial plaques. Though, extended use of antiseptics may be associated with side effects such as taste alteration, mucosal desquamation and tooth staining [3]. Probiotics inhibit the formation of dental plaque and calculus by lowering the salivary PH, thus acting as host-modulating agents. They can neutralize the free electrons which play a key role in plaque formation by producing antioxidant. Probiotic intervention in childhood reduces salivary mutans streptococci and reduces the risk of dental caries. There is significant reduction in gingival bleeding with the administration of probiotic Lactobacillus reute [4]. Probiotics offer an efficient alternative way, which is cost-effective and natural to combat periodontal disease. Probiotics modify host immunity both systemically and locally. They boost innate immunity and modulate pathogen induced inflammation through "Toll-like receptors" on dendritic cell. Intracellular pathogens are phagocytosed by Th1 response, while extracellular pathogens are cleared by Th2 response. Thus, Probiotics imitates response without periodontal destruction. Similarly, aggregation alteration is a vital proposed mechanics as Hetrofermentative Lactobacillus is the strongest inhibitor of Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis and Prevotella intermedia. Also, Lactobacillus salivaris and Lactobacillus gasseri show strong inhibition of periopathogenic bacteria [5]. Probiotic mixture shields epithelial barrier by preserving tight junction protein expression and prevent apoptosis of mucous membrane. Lactobacillus helveticus releases short peptides that promotes bone formation by stimulating osteoblasts, thus offering essential role in repair of periodontal bone. There is also increase in remission period in periodontal dressings containing Lactobacillus casei. The inflammation of gingival and periodontal tissues are usual

sources for oral malodors. Bacteria like Fusobacterium nucleatum, Porphyromonas gingivalis, Prevotella intermedia, and Treponema denticola are responsible for production of volatile sulphur compounds (VSC). These compounds contribute to halitosis. Lozenges and gum containing Streptococcus salivaris decrease VSC in halitosis patients [6]. Nature has a huge source of pro- and pre-biotic food. These probiotic foods are quite popular in Europe, Russia and China. Dairy product containing lactic acid is good for periodontal health. Fermented vegetables like turnips and cabbage, and teas like Kombucha and tibicos are great source of beneficial bacteria [7]. Probiotics are available in combination with prebiotic in form of gelatin capsules, powder sachet, or suspension. "BION" (combination of pre- and pro-biotic) has 0.48 billon spores of Lactobacillus acidophilus, Lactobacillus rhamnosus. Designer probiotics are utilized in treatment of HIV, also used as a novel vaccine delivery vehicle. The survival of probiotic microorganisms can be affected by quite a few factors such as the composition of the food matrix, exposure to oxygen, pH, carbon source, and variation of the time-temperature binomial throughout processing and storage process [8]. With the current state of understanding, probiotic organisms show an effect of improved health in the host's body. Recognition, assessment

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of safety and probiotic properties of new strains of microorganisms from conventional foods signify an essential practice. Microorganisms isolated from foods demonstrate superior sustainability in the food environment and ensure added sensory characteristics in contrast to microorganisms originating from intestines. In the future, new strains are to be used to design ecosystems to switch the microbiome in people with numerous conditions for therapeutic purposes. The prospects of using microorganisms in the production of food will depend on the progress in advance research and establishing the safety of their application in human beings [9].

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