

Implications of Probiotics in the Therapy and Prevention of Diseases in Dentistry

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Abstract

In the middle of the twentieth century, it was mentioned that the Bulgarians, known for the consumption of fermented milk, lived longer and had a better quality of life in comparison with other peoples. Over the years, researches has shown that the living microorganisms from probiotics are able to improve oral health, as well as promote so many other benefits in different areas of the human body. The objective of this literature review is to report the benefits of probiotics in dentistry, the action mechanisms of these bacteria, the species that make up these niches and what are the main forms of administration. The scientific articles were published between 2009 and 2017, originated from SciELO, PubMed and CAPES databases.

The main beneficial effect observed in patients who consumed probiotics was the increase of the body defenses. In addition, in dentistry, the probiotics have exhibited a high anti-inflammatory capacity and they are used for the caries treatment, oral candidiasis and halitosis, demonstrating, posteriorly, applications in periodontal diseases. The action mechanisms of these bacteria suggest that, in addition to promote the modulation of the host's defenses, they also have the ability to adhere to oral surfaces, both on mucous membranes and on hard surfaces, competing against pathogenic bacteria. The majority of the probiotics contain *Lactobacillus* and

Bifidobacterium, however, other bacteria strains were isolated, among them: *L. acidophilus*, *L. casei*, *L. rhamnosus*, *L. gasseri* and *L. reuteri*. The most common commercial form is bacteria inoculated in milk and its derivatives, such as yogurt, however, they can be found in a variety of forms like juices, candies, chewing gums and packaged as dietetic foods. It is concluded that the use of probiotics in dentistry is of great value, helping the professional in the prevention and treatment of harmful bacteria's in a healthy and natural way.

Keywords: Probiotics; Oral Pathologies; Bacteria; Bacteriology; Dentistry

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Introduction

The emergence of the dental use of probiotics is an exciting and innovative subject. Probiotics allow the treatment and prevention of the oral cavity diseases without the use of artificial medicines which are harmful to human health, using a natural environment, the human microbiota, to ensure the patients' oral health. This work aims to demonstrate the role of probiotics in the treatment of the oral cavity diseases, its action mechanism, the main associated bacteria and the vehicles used for the ingestion of these bacteria in dentistry.

Materials and Methods

Data were collected from some relevant and reliable databases such as SciELO, PubMed and CAPES, using eight of these, which were published between the years 2009 and 2017 as a reference for this literary review.

Results and Discussion

For many years it has been known about the application of probiotics in medicine in general. In the 20th century, it was observed that Bulgarians, who consumed fermented milk, lived longer compared to other populations (BASTOS, 2012), however, only in the last 20 years have been developed more researches related to the subject (OLIVEIRA, 2012).

Probiotics have been found to improve bowel function, because the intestinal flora is rich in microorganisms and depends on them for the proper functioning of the organ. Probiotics have phagocytic abilities, inhibitory function of bacterial growth, modulatory function at the site of the immune response and competitive inhibitory response (PINTO, 2011), in addition to other systemic actions such as cramp reduction, resulting from the probiotic composition conveyed to milk derivatives, which is rich in potassium. The beneficial results from the consumption of probiotics depend on the administration of a safe amount of the recipe, which must be determined according to the patient's systemic conditions (CHAVES, 2017).

In the dental field, probiotics have been playing a relevant role in the treatment of caries, halitosis, oral candidiasis, anti-inflammatory actions (YANINE, 2013) and later, applications in the periodontal diseases treatment. On the bacteria's action mechanism, it is assumed that the probiotics' bacteria is able to reduce the amount of the saliva's cariogenic bacteria (CHAVES, 2017), competing for adhesion on surfaces and, consequently, preventing adhesion, multiplication and colonization of the harmful bacteria to the dental organs. In addition, there is a combination of host immune responses, both local and systemic, with capacity to increase the body's defense capability. This is due to the ability of probiotics to enhance the activity of macrophages and increase the number of T cells and interferons, human body defense cells (LODI, 2015).

When it comes to halitosis, probiotics, in addition to competing adhesion sites with pathogenic bacteria, secrete organic acids, hydrogen peroxides and bacteriocins, which have antimicrobial action in the human body. In addition, they have the capacity to alter the local pH, a change that is responsible for preventing pathogens from establishing easily in the area (BONIFAIT, 2009).

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The bacteria that most commonly make up the probiotic are of the species *Lactobacillus*, *Bifidobacterium*, *Propionibacterium* and *Streptococcus*. Those belonging to the species of *Lactobacillus* are *L. ehamnosus*, *L. acidophilus*, *L. reuteri*, *L. johnsonii* and *L. gasseri*. *Bifidobacterium* species are *B. infantis*, *B. bifidum* and *B. longum*. All of these are Gram-positive acidophilic bacteria present in the human microbiota (BASTOS, 2012).

In the market, several vehicles have been tested for probiotic bacteria, among these vehicles are milk derivatives, capsules, fruit juices, ice creams, tablets, straws and pastilles (OLIVEIRA, 2012). However, the most studied, diffused and used vehicle as a natural environment among those mentioned above is yogurt (SOUZA, 2011).

Conclusion

Based on the studies carried out, it can be understood that, although modern and still little explored, probiotics has been applied in dentistry and has demonstrated positive and convincing results in relation to its proposal. The results bring the glimpse of a simpler and more effective dentistry, based on treatments that use natural resources. It is expected that the probiotics theme will be still studied and probed and, in the medium and long term, beneficial results can be observed in patients treated with halitosis, caries, inflammation, periodontal diseases, oral candidiasis and many other diseases as new applications of probiotic treatment in dentistry.

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