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Elucidation of Developmental Mechanism of Periodontal Diseases by Excessive Intake of Salt

Hidenobu Senpuku, Ryoma Nakao

Department of Bacteriology I
National Institute of Infectious Diseases

Summary

Periodontal diseases are infected by an anaerobic oral bacteria such as *Porphyromonas gingivalis* and *Prevotella denticola* in the periodontal tissue, and are the infectious diseases which causes absorption of an alveolar bone as a result of the chronic inflammation. It is feared that other systemic diseases (diabetes, cerebrovascular disease, heat disease, etc.) are more likely to be caused in periodontal diseases. It is important to clarify the onset mechanism of periodontal diseases. While salt is used for seasoning foods, it is one of the essential mineral components required for the maintenance of human cells. However, a recent research has reported that excessive salt intake induces pathogenic type 17 helper T cells (Th17), which affects the intestinal microbiome and reduces *Lactobacillus*. Lactobacilli are commensal bacteria in the oral cavity and contradict the periodontal diseases pathogens. Therefore, we suppose that excessive intake of salt may decrease lactobacilli in the oral cavity and create a condition in which periodontal diseases bacteria are easily infected. We investigated how oral bacteria flora changes by ingesting a high salt diet to mice. When mice were fed a diet containing 4% salt diet every days, a decrease in *Lactobacillus* on the tooth surface and an increase *Staphylococcus* were observed at 14 days after ingestion compared with 0.5% salt food (regular diet). An increase in the number of anaerobic bacteria was observed when *P. gingivalis* was inoculated in the oral cavity from mice fed a high salt diet for 14 days. In addition, the opportunistic pathogen, *Staphylococcus* was also increased. Daily intake of high salt diet continues for 150 days, lead to a decrease in the number of lactobacillus, alteration of oral flora, and infection of *P. gingialis* may induces periodontal diseases environment due to an increase in anaerobic bacteria. Daily intake of high-salt diet may lead to the development of periodontal diseases and systemic diseases such as aspiration pneumoniae through the oral cavity. This suggested that a controlled salt in diet was important, such as refraining from high-salt daily intake.