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Halitosis and its relationship to periodontal disease: Microbial causes and Nonsurgical treatment approaches.

**Abstract:**

Periodontal disease is the major cause of halitosis (bad breath), as bacteria inside gum pockets produce gases like hydrogen sulfide ($H_2S$) and methyl mercaptan ($CH_3SH$). Therefore, understanding how periodontal disease relates to halitosis is important for improving oral health. This literature review explains how effective different treatments are in reducing the bacteria that are responsible for halitosis, focusing on whether non-surgical treatments like scaling and root planing (SRP) are enough to manage halitosis in periodontal disease. We reviewed research comparing levels of volatile sulfur compounds (VSCs) in people with periodontitis versus healthy controls and assessed the effectiveness of treatments like SRP, antimicrobial mouthwashes, probiotics, laser therapy, and Oral Microbiota Transplantation (OMT). The studies showed that SRP significantly reduces bacterial and VSC levels, improving breath, but it does not eliminate bacteria in gum pockets and works better combined with other treatments. Mouthwashes provide a short-term solution, but they are less effective. Probiotics and laser therapy show a good result, but still, laser therapy is expensive and not everyone can afford it, and new research into OMT could give a future solution. These findings show that treating halitosis requires deep cleaning, bacterial control, and regular dental checkups to improve patient oral health.