

Does Treatment of Periodontal Disease Influence Systemic Disease?



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KEYWORDS

- Arthritis, rheumatoid • Atherosclerosis • Bacteremia • Cardiovascular diseases
- Inflammation • Intervention studies • Oral – general health • Pneumonia, aspiration

KEY POINTS

- Infection of the periodontal tissues causes inflammatory responses, both locally and systemically.
- Routine activities, such as chewing hard food items or tooth brushing or flossing, and periodontal treatment cause bacteremia in persons with periodontal infection.
- Periodontal treatment can lower levels of oral bacteria, several systemic disease end-points, and markers of inflammation, and hence does influence systemic diseases.
- There is insufficient scientific evidence to claim that periodontal treatment should be performed solely to prevent or treat systemic diseases.

INTRODUCTION

Much attention is drawn to the notion that oral health is an important and indispensable element of general health. The lay press has widely touted the links between oral and systemic health, but not always with attention to the quality of the source information and with close scrutiny of the underlying scientific evidence. Indeed, an entire industry based on the oral-systemic relationship has developed and gained foothold in the conscience of professional colleagues and the public alike. However, claims are often loosely based on scientific evidence and are the result of overinterpretation of the available data (recall “Floss or Die”). With patients accumulating widely available (mis)information, it is increasingly important for the dental practitioner to be knowledgeable about the actual current scientific evidence regarding the effects of periodontal disease and its treatment on systemic health.

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From public health and economic viewpoints, this is an important issue. Given that the estimated diabetes-related costs in the United States amount to \$245 billion, with \$176 billion in direct medical and \$69 billion indirect (disability, work loss, premature death),¹ the possibility that dental professionals could improve the quality of life of patients and diminish the economic burden for individuals affected and for society is an intriguing notion.

The overarching goal of this article is to summarize the existing evidence for the effects of periodontal treatment on general health. The specific goals are to provide an update on the state of the science regarding mechanisms that may explain the connections between periodontal disease and systemic diseases and effects of periodontal treatment on general health.

This goal will enable the reader to

- Understand that the underlying mechanisms are similar for most all of the diseases described
- Understand the systemic effects of periodontal treatment
- Be able to critically interpret future scientific reports
- Explain to their patients what is known and what is not known
- Avoid the pitfalls of the current trends to overinterpret the evidence
- Practice evidence-based dentistry.

Scannapieco and colleagues² described in a comprehensive review published in January 2010 the then existing evidence for the effects of periodontal treatment on various general diseases. Therefore, this review focuses on the evidence published since 2010 and preferentially cites systematic reviews and meta-analyses in the relevant areas because they pool several studies to gain more weight and statistical power for their conclusions.

Periodontitis—What Is It?

Everyone knows what periodontal disease is—or do they? Dental clinicians know the condition when they see it, but their diagnosis and successful treatment will depend on their knowledge of each individual patient. Research teams have historically created their own periodontitis case definitions, based on a multitude of periodontal parameters. This lack of a global, generally accepted and applied case definition for periodontitis is often overlooked, but is one of the most important factors in periodontal research that prevents direct comparison of results generated by different study teams.³ For example, Manau and collaborators⁴ examined 1296 individuals while using more than 50 different measures of periodontitis used in 23 different published studies. Then they applied 14 periodontitis published case definitions to their data and found the prevalence of periodontitis in their study group ranged from 2.2% to 70.8%, with a mean of 35.9% and a median of 29.7%, depending on how periodontitis was defined. So whether an association is statistically significant can depend on which measures were made and on the definition of the disease. This disparity in definitions is one of the main reasons it is so difficult to compare the results of different studies—and so challenging to come to firm conclusions about the strength of the association between periodontal disease and treatment and any systemic disease or condition.

SYSTEMIC EFFECTS OF PERIODONTAL INFECTION

How Does Periodontal Infection Affect Systemic Health?

Fig. 1 depicts the 3 major mechanisms by which periodontal infection is thought to affect the rest of the body. Because these 3 mechanistic pathways also present the

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