Relationship of Periodontal Infection to Diabetes: Glycemic Control, Complications and Occurrence

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Abstract: This report provides an overview of the evidence that periodontal disease adversely affects glycemic control and contributes to the risk for developing diabetes complications and possibly diabetes itself. The major focus will be evidence derived from both epidemiological observational studies and investigations of non-surgical periodontal therapy.

Diabetes mellitus and periodontal disease are two common chronic diseases that have long been considered to be biologically linked. Diabetes is an important chronic disease globally. The World Health Organization (WHO) declared the rate of increasing diabetes prevalence an epidemic.

Two longitudinal observational studies provide evidence to support the effect of severe periodontitis on increased risk for poorer glycemic control. The treatment studies are a heterogeneous set of reports that include randomized clinical trials (RCTs) and studies that are not RCTs. Of the RCTs reported in the literature, several report a beneficial effect for periodontal therapy although some RCTs do not. Recent meta-analyses of the intervention studies provide supporting evidence that non-surgical periodontal therapy improves glycemic control.

Poor glycemic control is a major determinant for the development of the chronic complications of diabetes. Emerging evidence from a limited number of observational studies suggests periodontal disease is associated with increased risk for diabetes complications, including cardiovascular disease, cardio-renal mortality, and renal disease. There is also evidence that periodontal infection may be a risk factor for the development of diabetes.

Conclusion: The evidence supports periodontal infection having an adverse effect on glycemic control and may be a risk factor for the occurrence of diabetes and its complications. Further rigorously conducted randomized clinical trials are necessary to unequivocally establish that treating periodontal infections can contribute to glycemic control and to the reduction of the burden of diabetes complications. However, given the current evidence, it is prudent to consider treating periodontal infection in people with diabetes as an important component of their overall management plan for diabetes care.

Key words: Periodontal disease, Diabetes, Epidemiology, Periodontal treatment, Cohort studies, Randomized clinical trial

Introduction

Diabetes mellitus and periodontal disease are two common chronic diseases that are considered to be biologically linked. Diabetes is an important chronic disease globally as reflected in the World Health Organization (WHO) declaring the rate of increase in diabetes prevalence an epidemic. The WHO estimated there were 30 million people who had diabetes worldwide in 1985. This number increased to 135 million by 1995, and reached 217 million in 2005. By 2030 WHO predicts this number to increase to at least 366 million4. This growth in diabetes prevalence, due principally to increasing prevalence of type 2 diabetes, is occurring in both developing and developed countries. The five countries with the largest predicted increases in diabetes prevalence are India, China, United States (U.S.), Indonesia, and Japan1. The Fig. 1 shows the WHO estimates for global prevalence of diabetes for adults ages 35–64 for the years 2000 and 2030. The color gradient for the different WHO regions indicates the darker the color, the greater the prevalence of diabetes. The gradient