Relationship between Periodontal Disease and Bone Metabolism in the Elderly

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Abstract: To examine the many links between oral health and general health and well-being, and to make the findings useful for policy-making, our longitudinal interdisciplinary study on aging (the Niigata Study) was begun in 1998. The purpose of the present report was to evaluate the relationship between bone metabolism and periodontal disease, taking renal function into consideration, in elderly Japanese subjects from the Niigata Study. The Niigata Study has been conducted every year in June for over 10 years (1998-2008), that is, 11 times in 10 years. We evaluated the relationships between osteoporosis and periodontal disease, bone metabolism and periodontal disease and renal function and periodontal disease.

According to our findings regarding the link with bone mineral density, some systemic factors such as low renal function and osteoporosis that contribute to both loss of bone mass and periodontal disease progression have been identified. Periodontal conditions, including bone metabolism, may be affected by low renal function.

Key words: Epidemiology, Periodontal disease, Bone turnover, Low renal function

Introduction

Osteoporosis is the most common metabolic bone disease among the elderly, and the incidence of osteoporotic fractures obviously increases with age. In addition, elderly people often experience periodontal destruction. Because bone loss is a common feature of periodontitis and osteoporosis, both diseases may share common etiologic agents that influence their processes. The final expression of periodontitis is predicated by the complex interactions occurring within an intricate mosaic of host, microbial factors and environmental factors.

In addition, chronic renal failure is associated with marked disturbances of bone structure and metabolism, and is a slowly progressive loss of renal function over months or years. A significant decrease in bone mineral density after transplantation is a serious finding. Low renal function is well accepted to increase osteoclast related to bone turnover and may influence bone metabolic parameters. There is a growing body of evidence indicating that low renal function is associated with disrupted regulation of vitamin D. While some systemic factors which contribute to loss of bone mass and periodontal progression have been identified, we hypothesized that renal function is associated with bone metabolism, and as a result is also associated with periodontal disease. We should therefore evaluate the relationship among bone turnover, renal function and periodontal disease to clarify the mechanism because these variables might be related to each other.

To examine the many links between oral health and general health and well-being, and to make the findings useful for policy-making, our longitudinal interdisciplinary study on aging (the Niigata Study) was begun in 1998. In this review, I described the relationship between bone metabolism and periodontal disease, taking renal function into consideration, in elderly Japanese subjects from the Niigata Study.

Outline of Niigata Study

According to a registry of residents, questionnaires...