Association between Impaired Dental Status and Cardiovascular Mortality in Elderly Subjects

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Abstract: Few have studied the association between impaired dental status and cardiovascular disease (CVD) mortality. Over the past decade, evidence has merged that there may be associations between oral health and systemic health condition. Many studies have found that periodontal disease is associated with an increased risk of CVD. However, limited information regarding tooth loss/chewing ability and CVD mortality is available. The aim of this review was to summarize the associations between impaired dental status and CVD mortality. The associations between tooth number and CVD mortality seem to be controversial. A follow-up study among Danish adults showed an inverse relationship between tooth number and hazard for incident CVD, while a larger cohort study among English subjects showed no substantial association between the number of missing teeth and CVD mortality. Further, in our cohort study of 697 Japanese individuals (80 years old), there were no associations between the number of teeth and CVD mortality in both genders during 4-year follow-up, while a significant association was observed in females during a subsequent 12-year follow-up. To date, a paucity of epidemiological research exists regarding the association between chewing ability and CVD mortality. Multivariate Cox regression analyses revealed significant associations between chewing ability and CVD mortality. However, the role of chewing ability on longevity seemed to be attenuated after age 85. Taken together, although some evidence was found to support the relationship between tooth loss/chewing ability and CVD mortality, the mechanisms underlying those associations remain unclear. Further study is needed to establish the causal relationship.

Key words: Tooth loss, Chewing ability, Elderly, Mortality, Cardiovascular

Introduction

Developed countries, including Japan, have issues related to aging. For instance, Japanese people over 65 years of age make up over 20% of the total population at present and it is speculated that over 30% of the total population will be over 65 by 2030. Cardiovascular disease (CVD), which has a multifactor etiology, is one of the leading causes of death in the world. Two-thirds of deaths in Japan are due to CVD including coronary heart disease (CHD) at present. It has been reported that oral health is related to the development of different cardiovascular disorders, and associations with periodontitis have been a particular focus of attention¹,². However, it is questionable to use periodontal disease as a parameter of oral health because the definition of periodontal disease is not uniform and a wide variation of threshold values have been used to identify the presence of periodontal disease. In this regard, tooth loss may be less prone to measurement error, but limited information is available regarding associations between tooth loss and CVD mortality. Tooth loss reduces chewing ability, and hence an association between chewing ability and CVD mortality should be also seen. However, there is limited information about the relationship between them. The biological mechanisms by which tooth loss can influence the development of CVD are still unknown, but two pathways can be proposed: the infection and inflammation pathway, and the nutritional pathway, as suggested by Janket et al.³. Chronic infection such as periodontal disease is one possible source for low-grade systemic inflammation, which has been