

論 文 内 容 要 旨

Association of number of teeth present with
nutrient intake and food group consumption

(現在歯数と栄養素摂取および
食品群別摂取量との関連)

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Introduction

Tooth loss reduces masticatory ability, which can limit the variety of foods a person eats and, in turn can affect nutrient intake and nutritional status. Although numerous studies have reported on teeth and nutrient intake, the dental care system and food culture have changed dramatically over time, leading to changes in the relationship between teeth and nutrient intake. Dietary habits are influenced by a number of factors, including age, gender and national food culture. Most previous studies have been conducted with older people, with few reports on middle-aged people.

This cross-sectional study aimed to clarify the associations between tooth loss, and nutrient intake and food consumption in a population of middle-aged Japanese adults.

Materials and methods

For the current study, the data were derived from the baseline survey of the J-MICC Study in the Shizuoka and Daiko areas. Inclusion criteria for the Shizuoka study were residents of the west-central area of Shizuoka Prefecture, Japan, and individuals who presented for health examinations at the Seirei Preventive Health Care Center in Hamamatsu City, Shizuoka Prefecture, Japan, between January 2006 and December 2007. Participants in the Daiko study were recruited primarily through a citywide mailbox distribution of flyers, personal communications, and community information (e.g., posters in public or commercial facilities) and visited the Daiko Medical Center of Nagoya University in Nagoya, Japan.

Subjects completed a self-administered questionnaire on the number of teeth, medical history (diabetes, cancer, heart disease, and stroke), educational background, employment, and lifestyle factors such as diet, smoking, and exercise habits. The subjects were divided into four groups according to the number of teeth present: 0, 1-19, 20-27, and 28-32 teeth. The background characteristics of the subjects were analyzed using the Kruskal-Wallis test for continuous variables and the Chi-square test for categorical data. We calculated nutrient intake and food group consumption per 1000 kcal of total energy intake.

Subjects with missing covariate data were excluded. All data analyses were performed with IBM SPSS Statistics for Windows version 28 (IBM Japan, Ltd, Tokyo, Japan).

Results

The number of participants was 5,005 in the Shizuoka area and 5,152 in the Daiko area, for a total of 10,157. Of these, we excluded 119 participants based on any of the following conditions: (i) lack of data on the number of teeth present; and (ii) declared that the number of teeth is 33 or more. In the end, 10,038 subjects remained for analysis. The age distribution of the subjects peaked at 50 to 59 years (32.8%), with a mean age \pm SD of 52.4 ± 9.6 years, and 52.2% of the subjects were female.

In both genders, those with 20-27 teeth were the highest, and edentulous subjects were the least. Mean age decreased with increasing number of remaining teeth. Current smokers and those with a high school education or less were more common among those with fewer teeth, while those who were employed were more common among those with remaining teeth.

Cholesterol intake was negatively associated with the number of teeth only in women ($p=0.026$). No significant difference was found in men, but a similar trend was observed. The consumption of confectioneries and eggs was also negatively associated with the number of teeth only in women ($p=0.017, 0.020$). The consumption of breads, however, was higher in those with more remaining teeth ($p=0.025$).

Discussion

In the present study, among adult women, the number of teeth present was positively associated with breads consumption and negatively associated with cholesterol, confectioneries, and eggs.

Regarding the number of teeth and breads consumption, edentulous individuals reported eating breads less frequently than those with natural teeth. On the other hand, those who reported the impact of dental and oral health on their ability to eat (those who reported difficulty eating due to oral health) reported more difficulty eating most of the foods studied than those who did not report this, with the exception of sliced and crusted bread.

The association between the number of teeth and cholesterol intake was similar to previous studies (Papas et al. 1998, Sahyoun et al. 2003, Hung et al, 2005). Cholesterol intake increased as the number of teeth decreased.

In the present study, there was also a significant association with egg consumption. Eggs are soft and easy to chew both before and after cooking, so it is assumed that they are preferred by people with few teeth, but there are few reports on the relationship between the number of teeth and eggs.

Wakai et al. (2010) reported that mean intakes of confectioneries were increased among those with fewer teeth. Furthermore, Yoshida et al. (2011) reported that the lost contact group reported significantly higher consumption of confectionaries (foods rich in sugar) than did the retained contact group. Both are similar to the present findings. It is predicted that the consumption of easy-to-chew confectioneries increased as the number of teeth decreased, but it is also possible that the high consumption of confectioneries led to an increased risk of dental caries and a decrease in the number of teeth.

Conclusions

The results suggest that the number of teeth present is independently associated with poor nutrition in Japanese adult women.