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Original Article

Beverage Consumption and the Prevalence of Tooth Loss in Pregnant Japanese Women : The Osaka Maternal and Child Health Study

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Abstract Recently, there has been growing interest in the impact of beverage consumption on dental health because changes have occurred in the types and quantities of beverage consumed. This cross-sectional study investigated the relationship between consumption frequencies of various beverages and the prevalence of tooth loss among young adult women. Study subjects were 1002 pregnant Japanese women. Tooth loss was defined as previous extraction of one or more teeth. Dietary habits were evaluated by a validated dietary history questionnaire. Logistic regression analysis was used to estimate the odds ratios and their 95% confidence intervals of tooth loss. Adjustment was made for age, gestation, parity, cigarette smoking, passive smoking at home and at work, family income, education, changes in diet in the previous one month, season when data were collected and body mass index. Of the 1002 subjects, 256 women had lost one or more teeth. Coffee consumption was independently associated with an increased prevalence of tooth loss. When subjects were divided according to consumption of coffee with or without sugar, an increased prevalence of tooth loss was found only in subjects who consumed coffee without addition of sugar. Compared with the lowest consumption of green tea, the intermediate but not the highest consumption of green tea was associated with an increased prevalence of tooth loss. There was no measurable association of intake of milk, black tea, cola, or 100% fruit juice with the prevalence of tooth loss. The findings suggest that coffee consumption might be associated with an increased prevalence of tooth loss among young adult women.

Key words : coffee, cross-sectional studies, Japan, pregnant women, tooth loss

Introduction

Two major roles of nutrition in oral health are clear : one systemic and the other local and

dietary¹⁾. Systemic nutrition affects the development, growth, and maintenance of the oral tissues and organs and promotes immunity and resistance to infection. Meanwhile, the oral cavity is subject to local or topical effects from whatever enters the mouth ; therefore food choices and dietary patterns are also essential determinants of oral health.

Recently, there has been growing interest in the

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impact of beverage consumption on dental health because changes have occurred in the types and quantities of beverages consumed among children and adolescents in the US²⁾. According to a national nutrition survey in Japan³⁾, intake of seasonings and beverages increased from 1980 to 2000 (109.4 g/day to 182.3 g/day), although data on changes in types or quantities of beverages alone are not available.

Several epidemiological studies have examined the relationship between beverages, especially sugared ones, and oral health^{4)~12)}. However, the possible effect of sugared beverages on dental health remains inconclusive. Marshall et al.⁴⁾ suggested that consumption of sugared soda pop and sugared beverages from powder, but not milk, 100% juice and water in early childhood was associated with increased caries risk. A cross-sectional study in Italian 7-, 9-, and 10-year-old schoolchildren showed a significant association of sweet drink intake with dental caries⁵⁾. In a cross-sectional study among Spanish schoolchildren, there was no association between consumption of sugared soft drinks, sugar-free soft drinks, or fruit juice and dental caries⁶⁾. Among 14-year-old children in England, tea drinkers had a lower number of teeth with caries than coffee drinkers and this effect was independent of the addition of sugar⁷⁾. Previous studies have shown that the addition of sugar in coffee or tea was associated with increased caries or tooth loss among adults^{8)~11)}. On the other hand, among Swedish 68-year-old men, consumption of coffee was inversely associated with the number of remaining teeth irrespective of the use of sugar¹²⁾. The impact of beverage consumption on dental health might not be explained only by the presence of sugars.

The aim of this study was to evaluate the relationship between consumption frequencies of various selected beverages and the prevalence of tooth loss in young Japanese women by using baseline data from the Osaka Maternal and Child Health Study (OMCHS).

Methods

Study population

The OMCHS is an ongoing prospective cohort study that investigates preventive factors and risk factors for maternal and child health, such as allergic disorders. Details of the OMCHS were described previously¹³⁾¹⁴⁾. Eligible women for the OMCHS were those who live in Neyagawa City, which is one of the 43 municipalities in Osaka Prefecture, a metropolis in Japan with a total population of approximately 8.8 million. Among the 3639 eligible pregnant women, 627 subjects (17.2%) participated in the OMCHS between November 2001 and March 2003. Eight pregnant women who did not live in Neyagawa City but who had become aware of the present study at an obstetric clinic before August 2002 decided by themselves to participate. Seventy-seven women received explanations of the OMCHS from public health nurses in 6 other municipalities from August 2002 to March 2003 and were enrolled in the OMCHS. From October 2002 to March 2003, 290 women were recruited from a university hospital and 3 obstetric hospitals in 3 other municipalities; it had been recommended by an obstetrician that these women participate in the OMCHS. Finally, a total of 1002 pregnant women gave their fully informed consent in writing and completed the two baseline questionnaires. The OMCHS was approved by the ethics committees of the Osaka City University School of Medicine and the Osaka Prefectural Institute of Public Health.

Questionnaire

At baseline, each participant filled out two self-administered questionnaires. The participants mailed the questionnaires to the data management center. The questionnaires were checked by research technicians, and missing or illogical answers were completed by telephone interview.

A validated self-administered diet history

questionnaire was used to assess dietary habits over the previous one month. The structure and validity of this questionnaire have been reported elsewhere¹⁵⁾¹⁶⁾. Subjects were asked to state how frequently they consumed each beverage item, based on 8 categories : 6 + times /day, 4–5 times/day, 2–3 times/day, 1 time/day, 4–6 times/ week, 2–3 times/week, 1 time/week, and < 1 time/week (except for milk, for which categories were 2 + times /day, 1 time/day, 4–6 times/week, 2–3 times/week, 1 time/week, 2–3 times/month, 1 time/month, and < 1 time/month).

The second self-administered questionnaire inquired about age, gestation, parity, smoking habits, passive smoking at home and at work, family income, education, height, weight, changes in diet in the previous one month, experience of extraction of one or more permanent teeth excluding third molars, and the number of remaining teeth. Tooth loss was defined as present via positive answer to the question, "Have you ever experienced the extraction of permanent teeth, excluding third molars?" Body mass index was calculated by self-reported body weight in kg by the square of the self-reported height in m.

Statistical methods

The consumption of beverages was categorized into three levels in order to represent the tertiles as closely as possible. Potential confounding factors, that is, age, gestation, parity, cigarette smoking, passive smoking at home and at work, family income, education, changes in diet in the previous one month, season when data were collected, and body mass index were selected. Age was classified into 2 categories (< 31 and 31 + years) ; gestation into 2 (< 18 and 18 + weeks); parity into 2 (0 and 1 +) ; cigarette smoking into 3 (never, former, and current) ; passive smoking at home into 3 (never, former, and current); passive smoking at work into 3 (never, former, and current) ; family income into 3 (< 4,000,000, 4,000, 000–5,999,999, and 6,000,000 + JPY/year) ; educa-

tion into 3 (< 13, 13–14, and 15 + years) ; changes in diet in the previous one month into 3 (none or seldom, slight, and substantial) ; and season when data were collected into 4 (spring, summer, fall, and winter). Body mass index was used as a continuous variable.

Logistic regression analysis was used to evaluate the crude odds ratios (ORs) and their 95% confidence intervals (CIs) for tooth loss relative to intake of beverages. Multiple logistic regression analysis was used to control for the potential confounding effects of selected factors. Analysis of covariance was employed to calculate adjusted means of lost teeth according to beverage consumption with allowance for confounding factors. The trend of the association was assessed by a logistic regression model with assignment of ordinal scores to levels of the independent variables. Two-sided p-values less than 0.05 were considered statistically significant. Analyses were carried out using the SAS software version 9.1 (SAS Institute, Inc., Cary, NC).

Results

About half of the women were enrolled by the 18th week of gestation, and had a parity of one or more. Slight or substantial changes in diet in the previous one month were experienced by 702 pregnant women because of nausea gravidarum (585 women), maternal or fetal health (107 women), and other reasons (10 women) (Table 1). Among the 1002 enrolled women (mean age 29.8), about one-fourth of subjects (25.5%) had lost one or more teeth (Table 2). Table 3 provides tertile categories of the consumption of selected beverages and the prevalence values. Tooth loss was the most frequent in the high consumption of coffee.

Table 4 shows crude and adjusted ORs for tooth loss (extraction of 1 + teeth) and geometric means of lost teeth in relation to the consumption of selected beverages. Compared with coffee consumption in the lowest tertile, its intake in the highest level was significantly associated with an

Table 1 Distribution of the baseline characteristics of the 1002 pregnant women, OMCHS, Japan

Factor	Number (%) or mean (SD)
Age (years)	
< 31	580 (57.9)
31 +	422 (42.1)
Gestation (weeks)	
< 18	508 (50.7)
18 +	494 (49.3)
Parity	
0	489 (48.8)
1 +	513 (51.2)
Cigarette smoking	
Never	697 (69.6)
Former	121 (12.1)
Current	184 (18.4)
Passive smoking at home	
Never	284 (28.3)
Former	224 (22.4)
Current	494 (49.3)
Passive smoking at work	
Never	344 (34.3)
Former	538 (53.7)
Current	120 (12.0)
Family income (yen/year)	
< 4,000,000	301 (30.0)
4,000,000 – 5,999,999	403 (40.2)
6,000,000 +	298 (29.7)
Education (years)	
< 13	323 (32.2)
13 – 14	413 (41.2)
15 +	266 (26.6)
Change in diet in the previous one month	
None or seldom	300 (29.9)
Slight	435 (43.4)
Substantial	267 (26.7)
Season when data were collected	
Spring	318 (31.7)
Summer	162 (16.2)
Fall	223 (22.3)
Winter	299 (29.8)
Body mass index (kg/m^2)	21.4 (2.8)

increased prevalence of tooth loss, showing a clear dose-response relationship. Adjustment for selected confounders under investigation attenuated this positive association, but the association remained significant (adjusted OR = 1.52, 95% CI = 1.04–2.22, P for linear trend = 0.03). However, coffee consumption was unrelated to the number of lost teeth; the adjusted geometric means of lost teeth were 2.2, 2.4, and 2.4 teeth among pregnant women in the lowest, intermediate, and highest tertile of coffee consumption, respectively. Compared with the lowest consumption of green tea, the intermediate but not the highest consumption of green tea was associated with an increased

Table 2 Distribution of tooth loss among the 1002 pregnant women, OMCHS, Japan

	Number of teeth lost	Number of subjects (%)
0	746 (74.5)	
1	85 (8.5)	
2	57 (5.7)	
3	29 (2.9)	
4	43 (4.3)	
5 +	42 (4.2)	

Table 3 Tertile categories of the consumption of selected beverages among the 1002 pregnant women, OMCHS, Japan

Variable	Consumption category		
	Low	Intermediate	High
Milk			
Frequency	< 4 times/week	4 – 7 times/week	2 + times/day
Prevalence	104/363 (28.7%)	130/542 (24.0%)	22/97 (22.7%)
Coffee			
Frequency	< 1 time/week	1 – 6 times/week	1 + time/day
Prevalence	85/405 (21.0%)	79/318 (24.8%)	92/279 (33.0%)
Green tea			
Frequency	< 4 times/day	4 – 5 times/day	6 + times/day
Prevalence	112/507 (22.1%)	95/311 (30.6%)	49/184 (26.6%)
Black tea			
Frequency	< 1 time/week	1 – 7 times/week	2 + times/day
Prevalence	110/456 (24.1%)	87/326 (26.7%)	59/220 (26.8%)
Cola			
Frequency	< 1 time/week	1 time/week	2 + times/week
Prevalence	140/563 (24.9%)	42/183 (23.0%)	74/256 (28.9%)
100% fruit juice			
Frequency	< 1 time/week	1 time/week	2 + times/week
Prevalence	102/440 (23.2%)	57/205 (27.8%)	97/357 (27.2%)

prevalence of tooth loss. This association changed little after adjustment for confounders (adjusted OR = 1.53, 95% CI = 1.10–2.13). There was no significant association between green tea consumption and the number of lost teeth. There was no measurable association of intake of milk, black tea, cola, or 100% fruit juice with the prevalence and the number of tooth loss.

When subjects were divided according to consumption of coffee with or without sugar, an increased prevalence of tooth loss was only apparent in subjects without the addition of sugar, after adjustment for confounders under study (Table 5). We also found a clear dose-response

Table 4 Odds ratios for tooth loss (extraction of 1 + teeth) and geometric means of lost teeth according to levels of beverage consumption among the 1002 pregnant women, OMCHS, Japan

Beverage	Crude odds ratio (95%CI)	Adjusted odds ratio (95%CI) ¹⁾	Adjusted means of lost teeth (95%CI) ¹⁾
Milk			
Low	1.00	1.00	2.3 (2.0 – 2.6)
Intermediate	0.79 (0.58 – 1.06)	0.79 (0.58 – 1.08)	2.4 (2.1 – 2.7)
High	0.73 (0.42 – 1.22)	0.79 (0.45 – 1.34)	2.2 (1.8 – 3.0)
P for linear trend	0.10	0.17	0.91
Coffee			
Low	1.00	1.00	2.2 (1.8 – 2.5)
Intermediate	1.24 (0.88 – 1.77)	1.25 (0.86 – 1.80)	2.4 (2.0 – 2.8)
High	1.85 (1.31 – 2.62)	1.52 (1.04 – 2.22)	2.4 (2.1 – 2.8)
P for linear trend	0.0005	0.03	0.35
Green tea			
Low	1.00	1.00	2.3 (2.0 – 2.6)
Intermediate	1.55 (1.13 – 2.14)	1.53 (1.10 – 2.13)	2.3 (2.0 – 2.7)
High	1.28 (0.86 – 1.88)	1.23 (0.81 – 1.84)	2.5 (2.0 – 3.1)
P for linear trend	0.07	0.11	0.52
Black tea			
Low	1.00	1.00	2.3 (2.0 – 2.6)
Intermediate	1.15 (0.83 – 1.59)	1.30 (0.92 – 1.83)	2.3 (1.9 – 2.7)
High	1.15 (0.80 – 1.66)	1.20 (0.81 – 1.76)	2.5 (2.0 – 3.0)
P for linear trend	0.39	0.25	0.51
Cola			
Low	1.00	1.00	2.2 (2.0 – 2.5)
Intermediate	0.90 (0.60 – 1.33)	0.89 (0.59 – 1.34)	2.0 (1.6 – 2.5)
High	1.23 (0.88 – 1.71)	1.16 (0.81 – 1.64)	2.7 (2.3 – 3.2)
P for linear trend	0.29	0.49	0.12
100% fruit juice			
Low	1.00	1.00	2.4 (2.1 – 2.8)
Intermediate	1.28 (0.87 – 1.86)	1.25 (0.84 – 1.85)	2.3 (1.9 – 2.8)
High	1.24 (0.90 – 1.71)	1.30 (0.93 – 1.83)	2.2 (1.9 – 2.6)
P for linear trend	0.19	0.12	0.37

¹⁾ Adjusted for the categories of age (< 31 and 31 + years), gestation (< 18 and 18 + weeks), parity (0 and 1 +), cigarette smoking (never, former, and current), passive smoking at home (never, former and current), passive smoking at work (never, former, and current), family income (< 4,000,000, 4,000,000 – 5,999,999, and 6,000,000 + JPY/year), education (< 13, 13 – 14, and 15 + years), changes in diet in the previous one month (none or seldom, slight, and substantial), season when data were collected (spring, summer, fall, and winter), and for body mass index as a continuous variable.

relationship between consumption of coffee without sugar and the prevalence of tooth loss. A significant interaction was observed in the association of coffee consumption in the intermediate but not the highest level with the prevalence of tooth loss between the intake of coffee with and without sugar ($P = 0.04$ and 0.18 for homogeneity of OR for the intermediate and

the highest consumption, respectively).

Discussion

We found a positive association between coffee consumption and the prevalence of tooth loss, although there was no association between coffee intake and the number of lost teeth. We have no immediate explanation for this observed association. Some inflammatory mediators would elicit clinical signs of inflammation and connective tissue destruction, as well as attachment loss with pocketing and bone loss¹⁷⁾. A cross-sectional study in Greece showed that compared with coffee nondrinkers, subjects who consumed 200 ml or more coffee per day had higher concentrations of serum interleukin 6, C-reactive protein, and tumor necrosis factor α ¹⁸⁾. Alternatively, coffee consumption may be regarded as a reflector of an unhealthy lifestyle. In a survey of a population sample of 25 to 60-year-old Austrians, coffee intake was positively associated with the consumption of main fat sources (meat and sausages), wine, and lemonades and inversely with intake of fruit and milk and performance of physical activity¹⁹⁾.

We were surprised to observe that an increased prevalence of tooth loss was only found in subjects who did not use sugar in the current study. The findings are in partial agreement with previous studies that indicated no relationship between sugar in coffee and the number of remaining teeth¹²⁾ and caries experience⁷⁾, but at variance with other studies that found a positive association of the use of sugar in coffee with tooth loss^{9,11)} and root caries¹⁰⁾. According to a systematic review regarding the relationship between sugar consumption and dental caries experience, sugar consumption is a moderate-to-weak risk factor for caries in people who expose to fluoride such as toothpaste and professional applications²⁰⁾. The increase of fluoride in the oral environment might reduce the detrimental effect of sugar on oral diseases, although both the total amount and the frequency of sugar are important elements in the

Table 5 Odds ratios and 95% confidence intervals (CIs) of tooth loss according to consumption of coffee with or without sugar, OMCHS, Japan

	Adjusted odds ratio (95%CI) ¹⁾	Adjusted odds ratio (95%CI) ¹⁾
	Coffee with sugar (n = 570)	Coffee without sugar (n = 432)
Low	1.00	1.00
Intermediate	0.86 (0.54 – 1.38)	2.10 (1.12 – 3.96)
High	1.24 (0.75 – 2.06)	2.07 (1.10 – 3.93)
P for linear trend	0.44	0.02

¹⁾ Odds ratios were calculated separately for each beverage and were adjusted for the categories of age (< 31 and 31 + years), gestation (< 18 and 18 + weeks), parity (0 and 1 +), cigarette smoking (never, former, and current), passive smoking at home (never, former and current), passive smoking at work (never, former, and current), family income (< 4,000,000, 4,000,000 – 5,999,999, and 6,000,000 + JPY/year), education (< 13, 13 – 14, and 15 + years), changes in diet in the previous one month (none or seldom, slight, and substantial), season when data were collected (spring, summer, fall, and winter), and for body mass index as a continuous variable.

etiology of dental diseases. Alternatively, unrecognized substances, but not sugar, in coffee might affect oral health. A quantitative review of randomized clinical trials demonstrated that coffee drinking was associated with an increase in total cholesterol, low density lipoprotein cholesterol, and triglyceride²¹⁾. Serum concentrations of triglycerides were inversely associated with the number of remaining teeth in a cross-sectional study of 68-year-old Swedish men¹²⁾. A cross-sectional study in Japanese middle-aged men found that instant coffee, but not brewed coffee, was associated with raised levels of serum low density lipoprotein cholesterol and decreased levels of serum triglycerides, however²²⁾.

In our study, a positive association between green tea intake and the prevalence of tooth loss was found only at the intermediate consumption level. It is difficult to interpret this observed association. One review paper mentioned that tea or some of its various components have been shown to have potentially anticariogenic in vitro effects such as a direct bactericidal effect against *Streptococcus mutans*, prevention of bacterial adherence to teeth, and inhibition of glucosyl transferase²³⁾. Our findings contradict this result. The effects of substances in green tea on dental caries in humans might be different from effects noted in laboratory research. Another possible explanation is that this association may

be merely a consequence of chance.

The major strengths of our study are the homogeneity of study subjects with respect to all being pregnant and adjustment for extensive information on potential confounding factors. Several methodological issues in this study warrant further consideration, however. In the present study, the outcome was determined from self-reported tooth loss because no dental examinations were performed. This self-reported tooth loss has not been validated in our subjects. However, several validation studies of self-reported dental health showed that there was no significant difference between the self-reported residual number of teeth and the actual number of teeth determined by clinical examination in spite of age or sex²⁴⁾²⁵⁾. Axelsson and Helgadottir²⁴⁾ reported that the kappa statistic for agreement between the self-reported number of remaining teeth and the number found at a clinical examination in the 18-year-old group, 35-to-44-year-old group, and the group aged 65 years or older were 0.56, 0.60, and 0.63, respectively. Persons are more knowledgeable about tooth loss than about signs and symptoms of disturbances of oral health, such as toothache, sore or swollen gums, and sensitivity of teeth to cold or heat²⁶⁾. Pitiphat et al.²⁷⁾ showed that the self-reported number of remaining teeth, fillings, root canal therapies, and prostheses were strongly correlated with clinical

records whereas self-reports appear to be less useful for the assessment of dental caries and periodontal disease. These data could support the use of self-reported tooth loss in epidemiological research as a key indicator of dental health status. According to a study on the reasons for extraction of permanent teeth among Japanese women, caries was the most frequent reason for tooth extraction (60.7%), followed by periodontal disease (32.1%)²⁸, which is an infection-mediated destruction of tooth-supporting tissue, such as attachment fibers and alveolar bone. Among the 256 women with tooth loss, the tooth loss in more than 50% of cases likely results from dental diseases although we do not have information on the reasons for tooth extraction because tooth loss was not a principal study outcome of the OMCHS. However, any outcome misclassification would likely have been evenly distributed across the three categories of the exposure under study. Consequently, this would have given rise to an underestimation of our findings. In the present study, information regarding the point in time when the teeth were lost was not available. Therefore, the time sequence between consumption of beverages and tooth loss could not be determined. Tooth loss explained only severe dental caries and periodontal disease, i.e., the early stage of dental disease was not taken into account in this study. The consequence would bias the estimates of association toward the null. We could not rule out the possibility that our results were biased by unmeasured confounders such as frequency of tooth brushing and access to professional dental service.

Since dietary data were self-reported, and do not necessarily reflect actual consumption, the possibility of misclassification might be a concern. Participants with tooth loss might not be aware of the possible ill effects of diet. The consequence would have been an underestimation of values in our results because of a nondifferential exposure misclassification. Our diet history questionnaire was designed to assess recent dietary intake, i.e.,

for one month before completing the questionnaire. Adjustment for the season when data were collected is likely to ease this limitation, however. Changes in diet in the past one month were controlled for because pregnant women are likely to change their diet for reasons such as nausea gravidarum.

Of a total 3639 eligible pregnant women in Neyagawa City, only 627 (17.2%) participated in this study. We are not able to assess a difference between participants and non-participants in Neyagawa City, because information on personal characteristics such as age, socioeconomic status, and experience of extraction of permanent teeth among non-participants was not available. Regarding the remaining 375 participants, we could not calculate the participation rate because the exact number of eligible subjects was not available. Also, we were not able to compare participants with non-participants in the 4 collaborating hospitals and 6 municipalities. Our subjects were not representative of Japanese women in the general population and the present finding may not be generalized. In fact, educational levels in the present study population were higher than in the general population. According to the 2000 population census of Japan²⁹, the proportions of women aged 30 to 34 years in Osaka Prefecture with years of education of < 13, 13 to 14, 15 +, and unknown were 49.2%, 32.3%, 13.6%, and 4.9%, respectively. The corresponding figures for the present study were 32.2%, 41.2%, 26.6%, and 0.0%, respectively. The prevalence of tooth loss in this study population (25.5%) is similar to that in a sample that consisted of Japanese women aged 25 to 30 years for a survey of dental disease in 1999 (27.3%), however³⁰.

On the basis of our results, consumption of coffee was associated with an increased prevalence of tooth loss in young adult women. The observed relationship in the present study does not necessarily indicate a causal relationship because of its cross-sectional nature. Further

investigations with more objective and detailed oral status and oral health behavior are necessary to clarify the relationship between coffee consumption and the prevalence of tooth loss. Research regarding biological mechanisms is also particularly required.

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Appendix

Space limitations preclude the inclusion as authors of the following members of the Osaka Maternal and Child Health Study Group : Hideharu Kanzaki, Mitsuyoshi Kitada, Department of Obstetrics and Gynecology, Kansai Medical University; Yorihiko Horikoshi, Department of Obstetrics and Gynecology, Kansai Medical University Kori ; Osamu Ishiko, Yuichiro Nakai, Junko Nishio, Seiichi Yamamasu, Department of Obstetrics and Gynecology, Osaka City University Graduate School of Medicine; Jinsuke Yasuda, Department of Obstetrics and Gynecology, Matsuhashita Memorial Hospital ; Seigo Kawai, Department of Obstetrics and Gynecology, Hoshigaoka

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日本人妊婦における飲料摂取と歯牙喪失有症率との関連： 大阪母子保健研究

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近年,嗜好飲料の種類とその摂取量が増加しており,これらの飲料の摂取が歯科疾患に与える影響について注目されている。本横断研究では,日本人の若年成人女性における各嗜好飲料の摂取頻度と歯牙喪失有症率との関連について検討した。研究対象者は1002名の妊婦である。過去に永久歯を1本以上抜歯した経験がある場合,歯牙喪失ありと定義した。妥当性の検証された食事歴法質問調査票を用いて食習慣を評価した。解析には多変量ロジスティック回帰分析を用いた。年齢,妊娠週,子数,喫煙,家庭及び職場での受動喫煙,家計の年収,教育歴,過去1ヶ月の食事変容,回答時の季節及びbody mass indexを補正した。1002名の研究対象者のうち,256名で抜歯経験があった。コーヒー摂取は有意に歯牙喪失の有症率の高まりと関連していた。コーヒー摂取の際の砂糖使用の有無による解析では,砂糖を使用していない群でのみコーヒー摂取と歯牙喪失の有意な正の関連を認めた。緑茶摂取については,第1三分位に比較して,第2三分位でのみ歯牙喪失と有意な正の関連を認めた。牛乳,紅茶,コーラ及び100%フルーツジュースの摂取と歯牙喪失との間に関連はなかった。本研究結果より,若年成人女性においてコーヒー摂取は歯牙喪失の有症率の高まりと関連があるのかもしれない。