Dental caries is known to be a multifactorial disease, and patient habits regarding oral hygiene and snacking are considered to be the most important factors in the caries development. In this study, tooth brushing and dietary habits associated with dental caries experience were analyzed. Dental caries experience was expressed as decayed and filled permanent teeth (DFT) and primary teeth (dft). The DFT values of adolescent patients (13–15 years of age) recorded in 2006 were significantly lower than those recorded in 2001 ($P < 0.01$). Next, those who underwent recall examinations in both 2001 and 2006 were analyzed, with attention given to the number of dft in 2001 and DFT increment over 5 years, in addition to relevant tooth brushing and dietary habits. The high dft group (dft 5 or more; $n = 43$) showed significantly greater DFT increment after 5 years than the low dft group (dft less than 5; $n = 39$) ($P < 0.05$). Further, the number of DFT was shown to be significantly lower in subjects who brushed before sleeping every day ($P < 0.05$). In addition, those who consumed meals and snacks on a regular schedule had significantly lower DFT scores than subjects with an irregular schedule ($P < 0.01$ and $P < 0.05$, respectively). These results suggest that dental caries occurrence in young permanent teeth is correlated with that in primary teeth, and instruction regarding good tooth brushing and dietary habits related to the development of dental caries should be provided.

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the scores of decayed and filled permanent teeth (DFT) for the 2 groups. There were no significant differences for DFT scores between the examination periods in the young adult group, whereas the adolescent group had significantly lower DFT scores in 2006 than in 2001 (Mann-Whitney test; \( P < 0.01 \)).

Since the results indicated that the number of dental caries in the adolescents decreased over 5 years, we decided to investigate the factors related to DFT scores, by focusing on the changes from previous caries experience, as well as tooth brushing and dietary habits.

It is well-known that dental caries status in young permanent dentition is a reflection of the corresponding status in primary dentition\(^3\). Therefore, the association between caries experience in primary dentition in the present adolescent group recorded in 2001 and DFT scores in 2006 was retrospectively analyzed. The total number of subjects in the adolescent group who underwent recall examinations...
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in both 2001 and 2006 was 82, thus approximately 80% of the patients in this group continued the recall examinations for a period of 5 years. Regression analysis showed that there was a positive correlation between the dft scores in 2001 and DFT increment over 5 years ($P<0.05$; $r = 0.22$).

Next, we performed 2 groups of adolescent subjects based on the number of dft; the low dft (less...
than 5; n = 43) and high dft (5 or more; n = 39) groups. The high dft group showed a significantly greater DFT increment over the 5-year period than the low dft group (P < 0.05; Mann-Whitney test) (Fig. 2). Another study that analyzed Norwegian children at the age of 5 and then again at 10 years old revealed that more than 2 surfaces with caries experience in the primary second molars at 5 years of age was a clinical predictor of high risk for caries at the age of 10\(^6\). Considering the results in the present study, 5 or more dft in the middle of the mixed dentition period (8–10 years of age) may indicate a high risk of dental caries in young permanent dentition 5 years later.

Accumulated evidence suggests that early acquisition of *Streptococcus mutans*, a pathogen of dental caries, is closely correlated to the development of dental caries in early childhood, which is considered to be compensated by other factors later, such as oral hygiene and dietary habits\(^5\). Therefore, the correlation of tooth brushing or dietary habits with DFT scores recorded in 2006 was also analyzed in the adolescent subjects. Figure 3 shows the questionnaire given to the 82 adolescents in this study, which including 4 inquiries regarding the tooth brushing habits and 5 in regard to dietary habits. The DFT scores were significantly lower in subjects who brushed before sleeping every day (P < 0.05; Mann-Whitney test) (Fig. 4). Since the reduced salivary amount that normally occurs during sleep leads to a risk of development of dental caries\(^6\), it is reasonable to speculate that brushing before sleeping is one of the most important factors involved with increment of dental caries occurrence. On the other hand, there were no significant correlations between the other 3 questions regarding tooth brushing habits and DFT increment.

As for dietary habits, the subjects who ate meals and snacks on a regular schedule had significantly lower DFT scores than those who did not (P < 0.01 and P < 0.05, respectively; Mann-Whitney test) (Fig. 5), which was consistent with the findings of a survey of Swedish girls aged 12 to 15 years old, which analyzed lifestyle factors and dental caries increment for a period of 3 years\(^5\). As the number of snacks consumed increased, DFT scores tended to be higher in the present study, though there were no significant differences. Of the 82 subjects, 42 answered that they drank tea and/or water at snack time, while 15 replied soft drinks, 14 replied milk, and 9 gave no answer. Flavonoids in several kinds of tea have been proven to inhibit bacterial adherence or possess antibacterial activities, thus tea drinking is regarded as one of the factors for prevention of dental caries\(^5\). However, in this present study, there were no significant differences between those who did and did not regularly consume tea.

These results revealed that dental caries in permanent teeth were correlated with those in primary teeth of the present adolescent subjects. Further, tooth brushing before sleeping was shown to be one of the important factors to reduce dental caries. In addition, several dietary habits associated with the reduction of dental caries, such as consuming meals and snacks on regular schedules, should be kept in mind when dietary instruction is given to patients and their guardians.

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