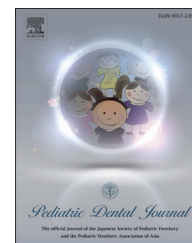


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Original Article

Prevalence of dental erosion and related factors in the deciduous dentition of Japanese children



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ABSTRACT

Objectives: The objectives of this study were to clarify the prevalence of dental erosion in the deciduous dentition of child patients, and to identify dietary habits and other factors related to dental erosion.

Methods: A total of 116 weaned child patients (67 boys, 49 girls) aged 2–6 years who attended the outpatient pediatric dental clinic of a university hospital for treatment or a periodic checkup were included in the study. A questionnaire survey of the patients' dietary habits and a clinical examination were performed. Dentition was divided into four areas, and responses to erosion-related questions were evaluated for each area using multiple logistic regression analysis.

Results: The prevalence of subjects with erosion, including pre-erosion lesions without tooth surface defects, was 86%; the prevalence of advanced erosion accompanied by tooth surface defects was 34%. Some food- and drink-related items were found to be significantly associated with erosion of the maxillary anterior teeth but not the mandibular teeth. Medication, use of fluoride, and past dental or medical history did not have any significant effect on erosion in any of the four areas.

Conclusions: The occurrence of dental erosion in deciduous dentition and factors related to its appearance were clarified for each area. An epidemiological survey is required to further reveal the state of deciduous dental erosion in Japanese children and to investigate the necessity of, and, if necessary, establish relevant guidelines for the prevention of dental erosion.

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1. Introduction

The decline in the prevalence and severity of dental caries among children over the past several decades has led to an increased interest in the epidemiology of dental erosion in children.

Dental erosion is defined as the superficial loss of dental hard tissue through a chemical process not involving bacteria [1,2]. Erosion is also classified into a type of tooth wear together with attrition and abrasion which are non-carious hard-tissue defects [2-4]. Although attrition is commonly observed in the deciduous dentition, abrasion is less frequent. Dental erosion is recognized as the most problematic process associated with primary tooth wear [5].

In the early stages of dental erosion, slight changes such as loss of gloss and flattening of the contour of the convex surface are observed [6]. In the advanced stages, extensive changes are accompanied by dentin exposure, such as concavities on the smooth surface and cupping of the incisal edges and cusps of the occlusal surface, as well as pulp exposure, which is compounded by the attrition and abrasion that occurs in these more severe cases [6]. However, it is difficult to distinguish between dental erosion and normal attrition in deciduous teeth because attrition of the incisal edges and occlusal surfaces is a natural occurrence [7,8].

Dental erosion is a multifactorial disease [6,9,10] and risk factors including dietary habits, biological factors (saliva, oral soft tissues, tooth alignment, morphology of the teeth), and behavioral habits (oral hygiene and behavioral habits associated with eating and drinking) have been investigated [11-16]. In children, the frequency of ingesting various soft drinks, such as acidic fruit juices and carbonated drinks, and the presence of dental caries are regarded as the main risk factors for dental erosion [17-19]. In this regard, sale and consumption of acidic foods and drinks have increased markedly over the past several decades along with changes in lifestyles and dietary habits. As a result, the prevalence of dental erosion in children has continuously increased [20,21].

Severe dental erosion may lead to coronal destruction or early tooth loss [3,22], and in children, this condition may influence the development of functions such as masticatory performance and pronunciation [8,22]. Detecting the presence of dental erosion in deciduous dentition can prevent erosion in the permanent dentition by identifying and eliminating the cause [23,24]. To protect children's oral health and normal development, it is important to detect erosion in the early stages.

The present study aimed to clarify the prevalence of dental erosion in the deciduous dentition and to identify dietary habits and other factors related to this erosion by surveying dental erosion in Japanese child patients treated at an outpatient dental clinic of a university hospital.

2. Subjects and methods

2.1. Selection of subjects

The cross-sectional study was performed between October, 2012 and July, 2013. Weaned 2-6-year-old children with

complete deciduous dentition were selected from among child patients who attended the outpatient pediatric dental clinic of Tokyo Medical and Dental University Dental Hospital for treatment or a periodic checkup.

Written consent was obtained from the parents of the children after the objective and importance of the study had been explained to them. A total of 116 child patients aged between 2 years 10 months and 6 years 11 months participated in the study. A questionnaire concerning each child was also completed by its parents. The questionnaires were administered on the same day as the clinical examination.

2.2. Questionnaire

Data on sociodemographic factors, dietary habits, vomiting, medication, oral habits, use of fluoride, and past dental and medical history were collected from the parents using a multiple-choice questionnaire. The parents were also interviewed to ensure that there were no misunderstandings related to the questions asked.

2.3. Clinical examination

Prior to the survey, the investigator, who obtained the data, observed the examination as it was performed by an experienced dentist and was thereafter trained in the use of that method.

The examination was performed in the outpatient dental clinic of a university hospital under artificial light using a mirror and a dental air syringe. When plaque adhesion was severe, it was wiped off with gauze or removed with a rotating brush before the examination. All erupted deciduous teeth were examined. In order to examine, each tooth was divided into nine regions (the buccal/labial side was divided into three regions extending from the gingival margin to the incisal edge; similarly, the palatal/lingual side was divided into three regions, the mesial and distal surfaces and the incisal edge or occlusal surface (see Fig. 1). Indices (Table 1) were set by referring to the International Caries Detection and Assessment System II (ICDAS II) [25], the 1993 UK National Survey of Children's Dental Health [26], and the O'Sullivan Index [27]. Scores of 0-6 were used to express the grade of dental erosion, and states other than erosion were scored 7, 8, or 9. Clinical dental photographs of each of the child patients were

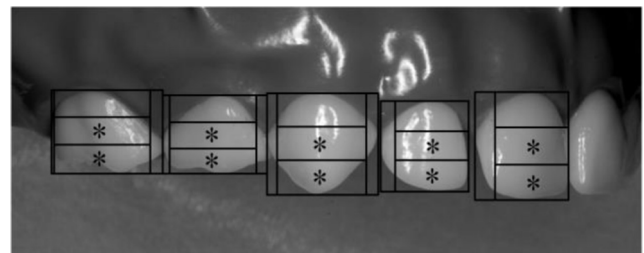


Fig. 1 – Data analysis for the regions indicated by the asterisk (*). This photograph shows deciduous right maxillary teeth from the central incisor to the second molar.

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