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## Longitudinal study of symptoms associated with teething: Prevalence and mothers' practices

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## ABSTRACT

**Background:** The results of the study support the view that teething is not associated with severe general symptoms. They present factors influencing their perception by mothers and methods to solve teething problems. **Aim:** The aim was to identify the teething symptoms and factors influencing their prevalence and the mothers' perception of teething and ways of solving them. **Methods:** A study was conducted among children aged 5–36 months and their mothers in Warsaw. It included questionnaire data (socio-demographic data, those related to nursing care, the baby's general condition, teething symptoms) and children's clinical examination. **Results:** Of 630 children included in the study (the mean age:  $21.84 \pm 8.28$  months) teething problems were reported in 79.7% of the patients: excessive salivation, swollen and reddened gum, an increased temperature and nervousness, anorexia, diarrhoea, cold-like symptoms, insertion of fingers/objects into the mouth. Teething problems were mildly associated with socio-demographic factors, birth weight and season of birth. Mothers used teething rings (66.8%), topical gels (63.3%), gingival massage (45.7%), comforting bottles (2.7%). In 16.8% of patients tooth brushing was started since the eruption of the first tooth. The choice of methods was influenced by the type of observed symptoms, education and maternal smoking habits. Pediatricians were the main source of knowledge. **Conclusion:** The general teething symptoms are associated with gingival swelling. The results demonstrate an overuse local remedies and negative impact of maternal smoking and lower level of education upon the solution problems. The hygienic neglect and feeding with a bottle indicates the significance of education.

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## Introduction

Eruption of deciduous teeth is associated with the presence of a variety of local and general ailments [1–7]. However, there is still no strong scientific evidence of an association between tooth eruption and a majority of the symptoms [8]. A large number of studies assess the occurrence of teething symptoms without analysing potential determinants of teething-related disturbances. Neither is there a fully documented association between local and general teething symptoms; therefore there is no purpose to use different methods of local teething problems. However, parents opt for a definite use of different types of remedies. Problems associated with teething are sometimes solved in a dangerous way, i.e. wearing an amber neckless, a penny tied various spices, cold baths [9, 10]. Children are given vegetables or frozen bakery goods to chew and bottle feeding or nursing [12, 13]. Mothers believe that it is also useful to provide antibiotics [12]. Local anaesthetics containing benzocaine, lignocaine are also frequently used despite an associated risk of methaemoglobinaemia, choking by a child and intoxication or agents containing choline salicylate associated with a risk of chemical burns and Reye's syndrome [1, 8, 13–16].

Therefore, it is vital to identify symptoms associated with deciduous teeth eruption and factors influencing their prevalence and mothers' perception of teething problems and ways to solve them.

## Material and methods

### Setting

The longitudinal study was conducted at the Department of Pediatric Dentistry, Warsaw Medical University, Poland.

### Participants

The parents and their children at the age of 5–36 months resident in Warsaw were invited to the study. The information about the access to the study was published in journals associated with children, distributed in nurseries, kindergartens and pediatric outpatient clinics.

Qualification to the study included children in a good general health condition with an erupted or erupting at least one deciduous tooth. The exclusion criteria were: a lack of a written consent by the parent, the natal teeth, oral or dental anomalies, systemic disease and present treatment, as well as a congenital physical or mental disability.

### Data collection

A two-year longitudinal study included eliciting a face-to-face history from the child's mother, conducted according to a questionnaire and a clinical examination of the child. Those were carried out by four pediatric dentists. The study was preceded by the course organized by the chief research worker on the methodology of eliciting history from

mothers and performing an oral examination as well as a pilot study in a group of 15 children.

The questionnaire contained questions concerning the child (sex, age, birth weight, the Apgar score, the season of birth, perinatal complications, general health, habits, local and systemic teething disturbances, oral hygienic procedures), mothers (age, level of education, habits, ways to solve teething problems). Oral examination was conducted in a dental surgery. The presence of erupted and erupting teeth (an erupting tooth was considered when the crown edge of the tooth had visibly emerged in the oral cavity and was no longer than 3 mm) [5], the gingival and mucosal membranes status, were noticed.

### Statistical analysis

In order to characterize the study groups, means and standard deviations of the study features as well as the number and the percentage of children with specific symptoms were calculated. The comparison between groups was performed by means of the chi-square test for categorized variables and the t-test for quantitative variables. Relationships between selected pairs of variables were described using Spearman's rank correlation coefficient. Moreover, for selected variables, logistic regression analysis was conducted, on the basis of which, quotients of chances of a relative risk were determined with confidence intervals (at the confidence level of 95%). The analyses were performed using the Statistica 12 programme and SPSS 22; the accepted significance level was 0.05.

## Ethics approval

The research protocol was approved by The Bioethics Committees of the Medical University of Warsaw (KB/221/2009).

## Results

### Participants

The study group included 630 children (300 girls and 330 boys), and their mothers. One hundred twenty six children were diagnosed with an active eruption of at least one tooth (Fig. 1).

Characteristics of children and their mothers are included in Table I. The pregnancy time was 26–42 weeks (average  $38.9 \pm 2.1$ ). Forty-three babies were born alive before 37 weeks of pregnancy (<28 weeks – 3 babies, between 32 and 37 weeks – 40 babies). Three premature babies were born at low birth weight (<2500 g).

### Teething symptoms

Symptoms associated by mothers with teething are presented in Table II. No general or local symptom was noted in 128 (20.3%) children. At least one general symptom was noted by 451 mothers (71.6%), without any specific difference between the group of children without an active tooth

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