

Tooth eruption and symptomatology: Are the symptoms assumed to be related to the tooth eruption really associated with teeth?

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Abstract. Despite little evidence, many various complaints might be associated with teething in children. Symptoms related with teething mostly result in delay diagnosis of underlying disease. In this study we explore the relationship between teething and symptoms commonly seen in pediatric clinics.

Children less than 36 months of age, who came to Medipol University Faculty of Medicine, between October 2013 and May 2014 for routine well-child visit, were recruited in the study. At visit time 318 infants (60.5%) had one or more visible tooth eruption. Participants were divided in five subgroups according to their age.

Parents of infants (mean age 11.5 months) completed questionnaires. The most commonly reported symptom was irritability in 12-18 months (74%), 24-30 months (57%) and 30-36 (44%) months' periods, drooling in 6-12 months (87%), loss of appetite in 18-24 months (64%). Irritability was statistically significant in all groups except 18-24 month. ($p=0.54$). Febrile fever was only statistically significant in 6-12 and 12-18 months groups. Increase in biting was become statistically significant after 12 months.

Although rates vary according to age group, many mild symptoms previously thought to be associated with teething were found temporally correlated with teething. Before parents/caregivers attribute these symptoms to tooth eruption other possible causes must be ruled out.

Key words: Tooth eruption, sign, symptom, primary tooth

1. Introduction

One of the important components of a routine healthy childcare is the dental development. In addition to their contributions to the digestion of food and the face aesthetics, the teeth, extremely deserve this attention with the complaints induced during the teethe. "Eruption" process, becoming of embedded in the gums teeth visible, is influenced by genetic features, the child's physical development and nutrition (1). This process starts automatically after the 6th month

and is controlled by different regulatory mechanisms (2). There are many complaints and symptoms accompanying this situation. It has been discussed for a long time whether these complaints are directly related to teething. Fever, decreased appetite, sialorrhea, anxiety, diarrhea, biting the objects, sleep disorders, crying spells and agitated mood are the complaints most associated with teething (3). It is known that teething is generally considered to be gingivitis; naturally these complaints go along with the teething at varying frequency. Importantly, these complaints, seen frequently at the period between 6-36 months, may mask serious underlying diseases. This period is characterized by limited communication between child and caregivers and, moreover, it has to be careful to recognize the life-threatening infections course with nonspecific symptoms. Both risky neglect of serious infection symptoms related with the teething or giving unnecessary importance to the

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complaints due to teething affect the physical health and the life quality of the children negatively (4). In studies, generally complaints were found to be associated with teething (5). However, it is also claimed that the relation between them is not statistically significant (6).

The researches on the families and health care professionals showed that teething is believed to cause a number of objective and subjective complaints (4, 7). However, many of these studies are designed as retrospective studies. In a study comparing the findings of prospective and retrospective studies, the frequency of the complaints was found significantly different (8). In this study, we investigated prospectively the frequent complaints and symptoms in children aged between 6-36 months and present their relationship with teething.

2. Materials and methods

The research was started with the confirmation report of the non-invasive clinical research ethics committee of our hospital dated 10.09.2013 and numbered 10840098-83.

Inclusion criteria;

- Boys and girls followed from healthy child clinic of our hospital
- Aged 6-36 months
- Without any chronic disease

In this prospective study, a specialist in pedodontology evaluated the families who applied to the healthy child clinic. As a teething criterion, the criteria that at least one tooth in the mouth being into the eruption period and the crown of the tooth erupted not being visible more than 3 mm over the gum were determined. "Teething related complaints" forms were given to the families of the patients to observe their babies and fill out at home. The complaints and their definitions examined in the studies including anxiety, excessive agitated mood, sialorrhea, crying spells, sleep disorders, increased biting, decreased appetite, diarrhea, subfebrile fever and febrile fever were involved in the form. The work group was created with the information obtained by this forms.

The same form was also filled by the physicians who attended the study for the healthy children who came with the aim of routine follow-up without any complaints and who do not show any evidence of teething during the examination. The control group was created with the information obtained by this.

In the subjective symptoms such as anxiety, excessive agitated mood, sialorrhea, sleep disorders, increased biting, decreased appetite,

crying spells, the comparisons with the normal times and the declarations of families were taken as the base. In diarrhea complaint, increase in number and significant change in consistency compared to the usual stools of the child was taken into consideration. Agitation was defined as yelling, screaming, crying state of the child different than the usual daily state and difficulty to placate.

In axillary measurement, fever between 37.0°C - 37.7°C were recorded as "subfebrile", fevers between 37.8° C and over were recorded as "febrile".

- 208 days without tooth extraction,
- 318 days with tooth extraction belonging to 526 children were determined.

In the statistical analysis of data obtained, the chi-square test was used and $p < 0.05$ was considered statistically significant.

3. Results

While 318 children determined to be teething by the pedodontist examination (60.5%) constituted the study group, control group was created with 208 children with no signs of teething (39.5%).

The children included in the study were evaluated by dividing into 5 groups of the ranges of 6-12, 12-18, 18-24, 24-30, 30-36 months. The distributions of the study and control groups according to age range are shown in Table 1.

Table 1. Distribution of children according to age groups

	with eruption	no eruption	Total
Age groups			
6-12 months	102 (%69)	45 (%31)	147 (%30)
12-18 months	89 (%64)	49 (%36)	138 (%26)
18-24 months	58 (%60)	39 (%40)	97 (%18)
24-30 months	37 (%49)	36 (%49)	73 (%13)
30-36 months	32 (%45)	39 (%55)	71 (%13)
Total	318 (%60.5)	208 (%39.5)	526 (%100)

In the study group 45.3% of children (n=144) were female and 54.7% male (n=174). In the control group 53.4% of children (n=111) were female, and 46.6% were male (n=97). Gender distribution is given in Table 2.

Table 2. The distribution of children according to gender

Gender	with eruption	no eruption	Total
Female	144 (%45.3)	111 (%53.4)	255 (%48.8)
Male	174 (%54.7)	97 (%46.6)	271 (%51.2)
Total	318 (%60.5)	208 (%39.5)	526 (%100)

Table 3. The incidence of complaints according to age group

	6-12 months			12-18 months			18-24 months			24-30 months			30-36 months		
	with eruption	no eruption	p	no eruption	with eruption	p	no eruption	with eruption	p	no eruption	with eruption	p	no eruption	with eruption	p
Anxiety	27 (%60)	81(%79)	0,009	13(%27)	65(%73)	0,0001	18(%46)	37(%64)	0,538	10(%28)	21(%57)	0,012	6(%15)	14(%44)	0,016
Excessive Agitation	5 (%11)	20(%20)	0,165	1(%2)	7(%8)	0,259	1(%3)	6(%10)	0,236	1(%3)	0(%)	0,493	0(%)	0(%)	null
Diarrhea	2 (%4)	34(%33)	0,0001	3(%6)	24(%27)	0,002	0(%)	9(%16)	0,01	1(%3)	5(%14)	0,199	0(%)	3(%9)	0,087
Crying Spells	7 (%16)	45(%44)	0,0001	3(%6)	24(%27)	0,002	2(%5)	9(%16)	0,191	1(%3)	3(%8)	0,615	1(%3)	3(%9)	0,321
Saliva	27 (%60)	89(%87)	0,0001	8(%16)	55(%62)	0,0001	11(%28)	30(%52)	0,004	5(%14)	19(%51)	0,001	2(%5)	8(%25)	0,035
Febrile Fever	0 (%)	25(%25)	0,0001	0(%)	13(%15)	0,002	1(%3)	8(%14)	0,08	0(%)	2(%5)	0,832	1(%3)	0(%)	0,493
Subfebrile Fever	8 (%18)	39(%38)	0,013	8(%16)	34(%38)	0,007	4(%10)	18(%31)	0,025	3(%8)	10(%27)	0,064	6(%15)	9(%28)	0,247
Sleep Disorder	17 (%38)	37(%36)	0,958	11(%22)	56(%63)	0,0001	7(%18)	21(%36)	0,068	7(%19)	14(%38)	0,121	3(%8)	4(%13)	0,693
Biting	31 (%69)	82(%80)	0,132	14(%29)	56(%63)	0,0001	9(%23)	34(%59)	0,001	3(%8)	18(%49)	0,0001	1(%3)	10(%31)	0,002
Decrease in Apetite	13 (%29)	67(%66)	0,0001	10(%20)	47(%53)	0,0001	14(%36)	35(%60)	0,023	7(%19)	18(%49)	0,013	12(%31)	10(%31)	0,965

In 6-12 months group, restlessness was determined 80%, diarrhea 34%, crying spells 45%, increase in saliva 87%, febrile fever 25%, subfebrile fever 39% and anorexia, 66%. In other parameters, no statistically significant difference was determined with the control group. In 12-18 months group, the incidence of statistically significant parameters was determined as: restlessness 74%, diarrhea 28%, crying spells 28%, increase in saliva 62%, febrile fever 15%, subfebrile fever 39%, sleep disorders 64%, increase in biting 62% and anorexia 53%. In 18-24 months, the restlessness was determined as 74%, diarrhea 15%, increase in saliva 51%, subfebrile fever 31%, sleep disorder 43%, increased biting 58% and anorexia 60%. In 24-30 months, restlessness was observed in 56% of the children, increase in saliva 51%, subfebrile fever 27%, sleep disorder 51%, increase in biting 48%, and anorexia 48%. In other parameters, there was no statistically significant difference with the control group.

Only three symptoms were statistically found frequent at significant degree at the 30-36th months; restlessness 43%, sialorrhea 25%, increased biting 32%. The incidence of complaints according to the age groups is shown gregariously in Table 3.

4. Discussion

Teething is thought as a major problem because of belief accompanying subjective complaints that families and health professionals (9, 10). While this would lead to unnecessary hospital visits for inexperienced parents, or early diagnosis and management can be missed due to connecting the symptoms of fatal diseases to the teething. Studies investigating the relation between symptoms and teething showed that teething was associated with various symptoms and complaints (3). In our study consistent with the literature; restlessness, drooling, subfebrile fever and anorexia symptoms were determined to be associated with teething in children aged 6-30 months (3). Although this may lead parents and clinicians to behave relaxed rather than serious problem because of subjective nature of complaints (restlessness, drooling and anorexia symptoms), subfebrile fever may be result from many underlying condition. This must alert pediatricians to evaluate other conditions especially in irritability and subfebrile fever lasting 24 h or over. Agitation was not found associated with teething in any of the age groups. This could be explained as agitation may be related with other causes such as farting in younger ages, or small number of agitated

children in sample may be lead to restrict the statistical analysis.

According to the age and feeding style, frequency of defecation was found significantly higher than expected in teething periods of children aged 6-24 months. Although the pathogenesis has not been explained, without any additional complaint with diarrhea did not require further tests and treatments in teething periods. Compared with similar studies, we think that the higher incidences of diarrhea in our study may be due to the differences in the definition of diarrhea (11).

In our study, crying spells have been identified as associated with teething in children aged 6-24 months. Therefore, if there is no evidence except teething on physical examination in excessive crying which is a subjective complaint, it will be more proper to observe the patient and relief the family prior to starting further investigations with some of them are interventional.

Consistently, febrile fever can be seen at the rates of 25 % and 15 % respectively in children aged between 6-12 and 12-18 months in teething periods (12). Although this significance was found in our study, it should be given in order to overcome the underlying more severe diseases such as infections with insidious course in this period (7).

Sleep disorders was found significantly common in children aged 18-30 months teething periods. In younger children, sleep disorders in both groups is common probably due to secondary reasons such as infantile colic. In elders, the frequency of sleep disorders in both groups was lower. This case suggests that regular sleep patterns develop in months with neurological and endocrine maturation, and it may not be true to associate the statistical significance decreasing gradually at the 18-30th months with teething only.

There is a significant association with trying to bite the objects and teething at the 12-36th months ($p < 0.05$ in all age groups at this range). This state can be interpreted as the struggle against inflammation-induced pain and itching in the gums. Not having statistical significance in the younger age groups is associated with the children's continuously putting the objects they received to their mouths out of the teething periods, depending on the desire to recognize their hands and mouths. Loss of appetite is frequently observed in children teething at the 6-30th months. It is important to give information about strong association with teething especially at younger age groups (6-12, 12-18 months) because this knowledge relieves parents' worries.

Original Article

As previously mentioned, signs and symptoms related with teething can be seen commonly in healthy and patient children at any age group at changing rate and severity. This study, as we know, is the first prospective study investigating whether symptoms are related with teeth or not. Beyond this, large sample size enhances significance of our findings. Another important aspect of our study is that determining the relationship between the teething and the symptoms will decrease the unnecessary worry, the use of drugs and hospital visits.

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