Mothers' Reports on Systemic Signs and Symptoms Associated with Teething

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ABSTRACT

Purpose: The purpose of this study was to compare mothers' actual observations of signs and symptoms associated with the eruption of primary incisors in their infants with their own recollections of the same period after eruption was completed.

Methods: A comparative study was carried out with 45 non-institutionalized infants and their mothers. Oral clinical exams were performed daily for detection of tooth eruption. The mothers were also interviewed daily about signs and symptoms they thought were associated with teething in the previous 24 hours. One week after the data collection was done, the mothers answered the same questionnaire. Descriptive analysis and the McNemar test ($P<.05$) were performed.

Results: Statistically significant differences were found between the prospective and retrospective studies. Increased salivation ($P<.04$) and runny nose ($P<.001$) were reported less often and fever was reported more often ($P<.001$) in the retrospective evaluation.

Conclusions: Mothers reported similar manifestations of sleep disturbance, diarrhea, loss of appetite, and irritability in the prospective and retrospective studies. Increased salivation and runny nose were more frequently reported in the prospective study, whereas fever was reported 5 times more often in the retrospective study. (J Dent Child 2013;80(3):107-10)

Received February 28, 2012; Last Revision June 5, 2012; Revision Accepted June 20, 2012.

KEYWORDS: TEETHING, TOOTH ERUPTION, SIGNS AND SYMPTOMS

Eruption of primary teeth (teething) is often blamed for a variety of systemic manifestations in infants. It is well reported in the literature that a large portion of mothers and health professionals involved in caring for infants believe there is an association between eruption of primary teeth and systemic signs and symptoms.[1-8] Attributing these manifestations to tooth eruption, however, may contribute to a delayed diagnosis of a possibly serious health condition that may be more easily treated in the early stages.[9] A study of 50 children admitted to a hospital with signs and symptoms thought to be associated with tooth eruption found that medical conditions were diagnosed in 48 children, including one case of bacterial meningitis.[10]

Longitudinal studies of parents and caregivers on their perceptions of signs and symptoms associated with teething show that sleep disorders, loss of appetite, diarrhea, runny nose, and irritability were commonly reported.[11,12] Another longitudinal study, however, did not find a strong association between teething and the manifestation of systemic signs and symptoms.[13]

Recent retrospective studies describe that approximately 70% of mothers report an association between teething and systemic manifestations, such as fever and diarrhea.[9,14,15] Retrospective studies, however, may overestimate the reports of parents/caregivers regarding the

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presence of signs and symptoms during teething due to either memory bias or the fact that such an association is a common popular belief.

The purpose of this study is to compare mothers' actual observations of signs and symptoms associated with the eruption of primary incisors in their infants with their own recollections of the same period after eruption was completed.

METHODS

This study received approval from the Human Research Ethics Committee of the Universidade Federal de Minas Gerais, Belo Horizonte, Brazil. A pilot study was conducted with seven non-institutionalized infants between six and 15 months of age and their mothers selected by convenience through the Secretary of Health in the city of Diamantina, Brazil. These subjects were not enrolled in the main study. The pilot study was performed to test the data collection process and determine the applicability of the instruments. The data confirmed that there was no need to modify the instruments. Data collection was performed daily at the families' home during an 8-month period. The oral exam was done by pediatric dental residents using a head lamp and gauze. The occurrence of signs and symptoms during the eruption of primary incisors was assessed. Data collection began before the eruption of at least 1 of the incisors and ended 1 week after the eruption of the last incisor.

For the main study, a non-randomized convenience sample was chosen from the same infant registry. Eligible participants included mothers and their infants between five and 15 months of age with up to seven erupted incisors and no history of chronic disease or disorders that could confound the signs and symptoms assessed in the study.

Eleven pediatric dental residents were calibrated to examine the infants to determine tooth eruption. Mothers were interviewed to investigate the occurrence of signs and symptoms in the previous 24 hours, such as increased salivation, rash, runny nose, diarrhea, loss of appetite, cold, irritability, fever, smelly urine, constipation, vomiting, colic, and seizure. Signs and symptoms were recorded daily on a standardized chart. Erupted teeth not assessed on the day of eruption, that is, the day the incisal edge cut through the gingiva, or on the days before and after eruption were excluded from the analysis.

One week after the end of data collection, the mothers answered the same questionnaire on the signs and symptoms observed during the eruption of primary teeth and how they dealt with them.

STATISTICAL ANALYSIS

Statistical analysis was performed using SPSS 17.0 software (SPSS Inc, Chicago, Ill.) Mean, standard deviation (±SD), and minimum and maximum values were calculated for each quantitative variable, and frequency analysis was performed for the qualitative variable. The McNemar test was used to assess comparisons between the frequency of symptoms reported by mothers during and after eruption was completed.

RESULTS

Assuming a proportion of discordant pairs of 35 percent, with α=0.05 and 1-α=0.8, a total of 43 mother-infant pairs would be necessary to find significant differences using the McNemar test. Due to the possibility of dropouts, 53 pairs were recruited to participate in the study, 47 (~89%) of whom completed the longitudinal study and 45 (~84%) answered the retrospective questionnaire. The main reasons for withdrawal from the study were: family moved away from the city, infant did not exhibit teething, impossibility of daily assessment of eruption, and absence of the mother on the day scheduled for data collection.

A total of 231 teeth erupted throughout the study. The mean number of teeth per infant was nearly five (range=2-8). Table 1 displays the descriptive information on the infants and their mothers.

Statistically significant differences were found between the prospective and retrospective studies (Table 2) regarding increased salivation (P<.04), runny nose (P<.001), and fever (P<.001). Increased salivation and runny nose were more frequently reported in the prospective study, whereas fever was reported five times more often in the retrospective study. No statistically significant differences between studies were found regarding sleep disturbance, diarrhea, or loss of appetite.

Table 1. Characteristics of infants, mothers, and number of data collection days

Variable	Minimum	Maximum	Mean±(SD)
No. of teeth assessed	2	8	4.9±2.3
Age of infant (mos)	5	15	8.9±2.7
Age of mother (yrs)	16	41	27.8±6.8
Mother's schooling (yrs)	7	11	9.5±1.5
No. of collection days	38	178	106.1±33.5

Table 2. Signs and symptoms of teething reported by mothers in both the prospective and retrospective studies

Symptoms	Prospective study (N=47)	Retrospective study (N=45)	McNemar test *P*-value
Sleep disturbance	22	26	>.52
Increased salivation	37	26	<.04
Runny nose	33	12	<.001
Diarrhea	25	25	>.45
Loss of appetite	28	27	1.00
Irritability	43	45	-
Fever	8	40	<.001

In the retrospective study, all mothers reported that their infants became irritated when teething.

DISCUSSION

The design used in this study makes it original. This is the first study to compare the reports of mothers on the manifestation of signs and symptoms associated with the eruption of primary teeth at 2 different points in time: during eruption of the primary incisors, and following the completion of the eruption.

The decision was made to investigate non-institutionalized infants, because viral and bacterial infections are rapidly disseminated in day care centers and could affect the frequency of signs and symptoms.[16,17] Moreover, infants who receive care at home spend more time with their mothers, which may contribute toward more discerning observations and, consequently, a more reliable report of the signs and symptoms associated with teething. A limitation of this study, however, was not using objective measures of signs and symptoms such as irritability, loss of appetite, and increased salivation. Another limitation was the impossibility of verifying the fever reported by mothers.

In the prospective evaluation, methods were employed to minimize observer bias. The data collection sequence (interview with mother followed by oral clinical examination) was designed so that the mothers would not be biased regarding communicating more signs and symptoms when it was determined that a tooth was erupting.

The mothers reported similar manifestations of sleep disturbance, diarrhea, loss of appetite, and irritability in the prospective and retrospective studies. Previous studies using parents' reports describe similar findings.[6,11,12] Symptoms often associated with the eruption of primary teeth in prospective studies, such as increased salivation and runny nose, were surprisingly reported less in the retrospective evaluation. Fever was a frequently reported symptom in the retrospective evaluation, which corroborates the findings of some authors[1,9] but not of others.[11,12] The significant difference between the number of mothers who reported the presence of fever in the prospective and retrospective studies is thought to be due to both memory bias and the widespread belief that teething can cause fever.

It is possible that the retrospective evaluation in the present study was more reliable than those performed in previous studies, as the mothers were interviewed daily regarding the presence of signs and symptoms of teething in their infants. It is likely that the report of fever in previous studies does not reflect the reality,as the mothers did not participate in a prospective investigation and were not attentive to the presence of systemic alterations in their infants during the eruption of primary teeth.

CONCLUSIONS

Based on the results of this study, the following conclusions can be made:

1. Mothers reported infants' sleep disturbance, diarrhea, loss of appetite, and irritability both in the prospective and retrospective studies;
2. Fever was more frequently reported in the retrospective study;
3. Increased salivation and runny nose were less frequently reported in the retrospective study.

ACKNOWLEDGMENTS

This study was supported by the Brazilian Agency for the Coordination of Higher Education (CAPES), Ministry of Education, and State of Minas Gerais Research Foundation (FAPEMIG).

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