
Herpetic gingivostomatitis and teething difficulty in infants

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Abstract

This investigation was conducted to determine whether primary herpetic gingivostomatitis may be responsible for those signs and symptoms commonly attributed to teething in infants. Twenty infants presenting with a parental diagnosis which indicated teething difficulty were included in this study (Group A). Twenty infants who were in no distress served as controls (Group B). Oral swab samples were obtained from each infant and then processed to ascertain the presence of herpes simplex virus (HSV). Each infant's temperature and oral status also were recorded. Nine subjects in Group A (45%) were positive for HSV. Of these nine, seven had elevated temperatures (< 100° F) and all had signs of oral infection of varying severity. Of the 11 subjects in Group A who were negative for HSV, five had elevated temperatures, but none showed evidence of oral infection. Subjects in Group B were all negative for HSV, elevated temperature, and signs of oral infection. Results of this study suggest that oral HSV infection should be included in the differential diagnosis of infants presenting with a parental diagnosis of teething difficulty. (Pediatr Dent 14:82-85, 1992)

Introduction

Dental folklore holds that the eruption of primary teeth frequently is responsible for symptoms of general illness in infants. A recent item from the popular press reflects this belief by asserting that, "In fact, teething is a very traumatic experience for the infant. It not only causes pain but has a histaminic effect, almost like an allergy, and so the child's nose and eyes run and he has cold like symptoms with poor appetite and poor sleeping."¹

Historically, medical opinion often has regarded the teething process as essentially morbigenous and a frequent cause of infant mortality. The terms "pathological dentition" and "dentitio difficilis" were coined as descriptive indicators of the condition. Guthrie² cited an 18th century English source which states that "...above one-tenth part of all children die in teething." The Registrar General's report of 1839 attributed 5016 deaths in England and Wales to teething, and the 1842 report ascribed 12% of all deaths in children younger than 4 years old to the condition. In 1939, Witkin stated, "A century ago the great majority of all infants' ailments were ascribed to teething. The mortality of this cause alone was placed as high as 50%." He criticized this concept as a shortcoming of diagnostic competence, but at the same time argued that "pathological dentition" did occur in about 5% of infants and was responsible for weight loss, sleeplessness, fretfulness, elevated temperature, and other symptoms.³ A recent survey revealed that the idea of "pathological dentition" or "dentitio difficilis" is still extant among primary care pediatricians. Of 64 survey respondents, only five believed that teething was not responsible for symptoms

such as irritability, eating problems, wakefulness, and rashes. Eighteen felt teething could be responsible for temperature elevations up to 39°C.⁴ The teething process is no longer indicted for infant mortality but continues to be regarded as a disease entity by parents, physicians, and dentists.¹⁻⁸

The concept that tooth eruption, per se, could be responsible for symptoms more serious than a mild local irritation has been challenged by several authors. Neaderland⁹ has stated, "When we attribute concurrent symptoms to teething, the basic disease process which is their true cause may find serious culmination without proper treatment. The problem of teething thus resolves itself into one of diagnosis." He also noted that teething complaints are confined almost exclusively to the eruption of the primary dentition. Except for impacted third molars, where the cause of localized discomfort is quite evident, the eruption of the permanent dentition is free of the symptoms frequently ascribed to the eruption of the primary teeth. Other authors have rejected the idea that a normal developmental process such as primary tooth eruption could be responsible for fever, diarrhea, bronchitis, convulsions, colic, or rashes; they suggest that when these signs and symptoms occur, causes coincidental but unrelated to teething must be responsible.^{4, 10-12} In a singular prospective investigation of 126 normal infants over a prolonged period, Tasanen¹³ reported that careful daily examination of each child revealed no relationship between tooth eruption and the many symptoms popularly attributed to it. Aside from Tasanen's study, surprisingly little scientific investigation has been conducted to resolve the

teething controversy. A relatively recent review of the problem characterized the available literature as "undocumented, unscientific, and contradictory," and indicated that "much of the information gathered is subjective parental opinion."⁴

Herpetic Gingivostomatitis and Teething Complaints

Recently, several authors have suggested that tooth eruption in infants frequently may be blamed for symptoms caused by an undiagnosed primary herpetic infection.¹⁴⁻¹⁶ Circumstantial factors lend credibility to this proposition. Coincidentally, primary tooth eruption begins at about the time that infants are losing maternal antibody protection against the herpes virus.^{17, 18} Also, reports on teething difficulties have recorded symptoms which are remarkably consistent with primary oral herpetic infection such as fever, irritability, sleeplessness, and difficulty with eating.^{7, 19} However, these studies, as well as journal editorials and review papers on teething difficulty, have failed to consider herpetic infection as a possible cause of the symptoms.^{9, 20, 21} No report on teething problems has included testing for viral infection.

The purpose of this investigation was to determine whether oral herpetic infection should be included in the differential diagnosis of infants presenting with a parental chief complaint of teething difficulty.

Materials and Methods

Forty infants ranging in age from 7 to 30 months participated in this study. Of these, 20 were infants who were purportedly experiencing distress from tooth eruption (Group A). For an infant to be included in Group A, it was necessary for the accompanying parent to offer an unprompted chief complaint of "teething" or a variant identical in meaning, e.g., "teething difficulty," or "teething problem." This patient sample was collected over a three-year period at a dental school pediatric dentistry clinic, a community hospital walk-in clinic, and the private offices of a pediatric dentist and a pediatrician. Responsible personnel at each location were provided with written instructions pertaining to patient selection criteria, examination procedures, and viral sampling protocol.

Twenty infants who, according to the parents, were in no distress from teething, served as controls (Group B). These infants were seen at a local church's infant care facility and were selected by age-matching to Group A. All subjects in Group B were seen by one of the authors (CJE), who used the same examination procedures and culture protocol that were used for Group A subjects.

Samples for viral culture were obtained from infants in both groups by gently rubbing a sterile cotton tipped

applicator over the subject's gingiva. An effort was made to sample from an area of gingiva which was vesiculated, ulcerated, inflamed, or otherwise abnormal in appearance. When such an area could not be identified, the sample was obtained from any convenient gingival area. The applicator then was sealed in a tube containing Hank's medium and transported on ice to a virology laboratory. There the medium was plated for culture on tissue comprising human lung fibroblasts. The cultures were read every 24 hr for five days. A positive culture of herpes simplex virus (HSV) within the five-day period was regarded as indicative of an oral herpetic infection in the subject.

Information obtained on each subject was recorded on a prepared form and included name, age, gender, temperature, and oral findings. When temperatures were obtained by other than the oral method (skin tape, rectal), they were adjusted to oral values for comparison purposes. Parental information included name, address, and telephone number. Informed consent was obtained from parents for all subjects before the examination and culture sampling were performed.

Results

Positive cultures for HSV were obtained in nine of 20 infants who, according to parental information, were experiencing teething problems (Table, next page). All nine subjects exhibited oral infections of varying severity and seven of the nine had temperatures greater than 100° F. The remaining 11 subjects in Group A tested negative for HSV and none of them exhibited any sign of oral infection in spite of the teething complaint. Five of these 11 HSV-negative subjects had elevated temperatures. The scope of this investigation did not allow for a rigorous follow-up of Group A, HSV-negative subjects to determine other possible explanations for symptoms. However, it was learned incidentally that two of these subjects had otitis media and one had prodromic symptoms of varicella. All three had elevated temperatures at examination.

No subjects in Group B tested positive for HSV. All subjects in Group B had normal temperatures and normal oral findings.

According to Fisher's exact test, the finding of HSV-positive patients in Group A (symptomatic) as opposed to Group B (asymptomatic) was highly significant ($P < 0.001$).

Discussion

Eighty to 90% of the adult population has demonstrable levels of serum antibodies against HSV.^{14, 16, 17} This population has had exposure to HSV and developed antibodies as a result of infection, but few of these adults can recount, from memory or parental informa-

tion, an illness consistent with primary herpes simplex infection.^{12, 17, 22} An explanation may be that the primary infection in many instances was either unrecognized or misdiagnosed as teething difficulty.^{16, 23, 24}

In the nine subjects in our study who tested positive for HSV, there was considerable variation in the extent of oral involvement. Some exhibited widespread oral inflammation, vesicle formation, and ulceration; in others, the involved tissue was limited to a small area adjacent to erupting teeth. This variation may be the result of varying levels of maternal antibody protection in infants of teething age. Younger infants with higher residual levels of antibodies would experience milder infections and these would be more likely to go unrecognized or be dismissed as teething difficulty. Even though a mild response to primary HSV infection in infants has been well established,^{23, 25} it is possible this is not appreciated widely. Instead, many physicians and dentists might agree with Brook²⁶ who stated that the primary infection "...is so striking that a confident diagnosis can usually be made without resort to laboratory procedures." The very obvious, fulminant response may occur only in those older children and adults who have lost all passive immunity to HSV. Therefore, infants with teething complaints require a careful oral examination to reveal milder, more localized evidence of HSV infection.

A limitation in this investigation was the lack of follow-up for HSV-negative, symptomatic patients. A rigorous general examination with appropriate laboratory procedures may have determined alternate diagnoses for the "teething" symptomatology. However, the results of this investigation do lend credence to the previously untested hypothesis that a teething complaint may often be an unrecognized primary herpetic infection. This finding provides for implementation of a more rational approach to treatment in such instances.

Table. Breakdown of viral culture results and associated findings

Group	N	Temp Elev	Oral Involvement*		
			0	1	2
A (HSV +)	9	7	0	4	5
A (HSV -)	11	5	11	0	0
B (HSV +)	0	—	—	—	—
B (HSV -)	20	0	20	0	0

*Oral involvement assessment

0 — No signs of infection. Essentially normal oral findings.

1 — Signs of infection (inflammation, swelling, vesicles, ulceration) limited to area immediately adjacent to erupting tooth (teeth).

2 — Signs of infection (inflammation, swelling, vesicles, ulceration) extending beyond area immediately adjacent to teeth (to unattached gingiva, buccal and labial mucosa, tongue, palate, pharynx).

IRB Protocol #878-1908-077, Infant teething difficulty and herpes simplex infections, was approved by the Board on November 10, 1987.

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Percentage of uninsured children has increased

The proportion of children in the U.S. without private or public health insurance increased from roughly 13 to 18% between 1977 and 1987, according to a study by the Agency for Health Care Policy and Research (AHCPR).

The growth in the proportion of uninsured children in poor and low-income families rose from 21 to 31%. The study's authors wrote that the increases reflect a decline in private insurance coverage of children in two-parent families since 1977.

According to the authors, the findings show that virtually all employed parents accept private insurance when it is offered at their workplace, regardless of the family structure or income level. The study also examined how changes in the rates of private and public health insurance coverage since 1977 contributed to the number of uninsured children in 1987.