SYSTEMIC MANIFESTATIONS OF TEETHING SYNDROME IN INFANTS AND TODDLERS: DIAGNOSTIC CHALLENGES AND MANAGEMENT TACTICS

Alimova Nozimakhon Bakhtiyorovna
2nd-year Pediatric Resident, Bukhara State Medical Institute, Bukhara, Uzbekistan

Abstract: Teething is a normal developmental process in infancy, yet parents and clinicians frequently attribute a wide range of systemic symptoms to it, including fever, diarrhea, irritability, sleep disturbance and poor feeding. This article reviews the current evidence on the systemic manifestations of tooth eruption in infants and toddlers and examines the diagnostic difficulties that arise when a febrile or systemically unwell child is assumed to be teething. The review shows that local signs of eruption, such as gum swelling, drooling and biting, are common, while the evidence for a true fever or gastrointestinal illness caused by teething is weak. Attributing a significant illness to teething can delay the diagnosis of infection. The article also considers management, including non-pharmacological measures and the safety concerns raised about benzocaine-containing oral products. On this basis, a practical diagnostic approach is proposed: teething is considered a diagnosis of exclusion when fever or systemic symptoms are present, and the clinician should look for another cause before accepting teething as the explanation.

Keywords: teething, tooth eruption, infants, toddlers, fever, diagnostic error, benzocaine, methemoglobinemia, pediatric primary care.

INTRODUCTION

Tooth eruption is one of the first major developmental milestones of infancy. The primary dentition normally begins to appear around six months of age and is usually completed by about three years, when the twenty primary teeth are in place. The process is accompanied by local changes in the gums, including swelling, tenderness and increased salivation. Because these changes are visible and occur during a period when infants are also developing rapidly in other ways, parents frequently link any new symptom in this age group to teething.

This tendency has a clinical cost. A child who is febrile, vomiting, has diarrhea or appears unwell may be managed as teething when the true cause is an infection, which may be serious. Among the infections that may be overlooked are otitis media, urinary tract infection, respiratory infection, herpetic gingivostomatitis and, less frequently, meningitis. Infants under three months of age with fever require urgent evaluation regardless of the parents' explanation, and an incorrect attribution at this stage can have severe consequences.

The aim of this article is to review the evidence on the systemic manifestations of teething, to identify the diagnostic challenges that arise when systemic symptoms are attributed to tooth eruption, and to propose a practical management approach for primary care and pediatric practice. The article addresses three questions. First, which symptoms are reliably associated with teething? Second, which symptoms are not supported by the evidence and should prompt a search for another cause? Third, what measures are safe and effective for relieving teething discomfort?

LITERATURE REVIEW AND METHODOLOGY

The evidence on teething and its systemic effects has been examined through several types of study. The largest synthesis available to the present author is a meta-analysis of observational studies by Massignan and colleagues [1]. The analysis pooled data on 3,506 healthy children aged 36 months or younger, and found that about 71% had at least one local or systemic sign or symptom during eruption. Fever was reported in roughly a quarter of the children, but the temperature rise was generally below the

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.

level that defines a fever. The authors concluded that gum irritation, irritability and drooling are the characteristic features of teething, while fever and other systemic signs are less consistently associated with it.

A systematic review published in the South African Dental Journal in 2020 reached a more cautious conclusion. It found that the evidence on teething signs and symptoms did not clearly prove or disprove an association with systemic illness, and it listed diarrhea among the commonly reported symptoms. The authors stated that further objective studies are needed [2]. This finding is important because it shows that the evidence base is limited in quality, not only in quantity. Many of the studies rely on parental reports, which are vulnerable to recall bias and to the expectation that teething should cause symptoms.

A structured review published in 2025 went further and concluded that there is no credible evidence linking teething to high fever or to gastrointestinal disturbance [3]. Taken together, these sources form the basis of the present review.

The present article is a narrative synthesis rather than a new systematic review. The sources were selected from peer-reviewed journals and from official regulatory communications published in 2016 or later. Studies were included when they addressed systemic symptoms of teething in infants or the safety of products used to relieve teething pain. The analysis proceeded in three steps: identification of the symptoms reported in the literature, classification of these symptoms according to the strength of the evidence linking them to teething, and formulation of a diagnostic and management approach. No patient data were collected, so the recommendations are presented as clinical reasoning based on the evidence reviewed.

LOCAL AND SYSTEMIC FEATURES OF TOOTH ERUPTION

The local features of eruption are well documented and are the most reliable signs of teething. Gum swelling and tenderness over the erupting tooth are common, and infants often show increased salivation, drooling and a tendency to chew on objects. These signs typically appear over several days before a tooth breaks through the gum and may persist for a short period afterwards. Irritability and disturbed sleep are also frequently reported, and they are consistent with the discomfort that accompanies the process. Massignan and colleagues [1] identified gum irritation, irritability and drooling as the main signs associated with teething, and this pattern is the reference point for distinguishing teething from other conditions.

Systemic symptoms are a different matter. Parents commonly report fever, diarrhea, vomiting, cough, rash and changes in appetite during the teething period. Some of these reports are likely to be accurate, because a child who is uncomfortable may feed less and sleep poorly, and a mild temperature rise can occur during a period of local inflammation. However, the evidence does not support the view that teething produces a true fever of 38.0 °C or above, or that it causes significant diarrhea. The consistency of the conclusions across the reviews reviewed here [1], [2], [3] suggests that clinicians should treat these symptoms as signals requiring evaluation rather than as expected features of teething.

An additional point concerns the timing of symptoms. Teething usually lasts several days for each tooth and recurs during the eruption of later teeth. An illness that begins with fever and persists beyond the expected duration of local symptoms, or that worsens over time, is unlikely to be explained by teething. The duration and progression of symptoms are therefore important diagnostic features and should be recorded carefully.

DIAGNOSTIC CHALLENGES

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.

The main diagnostic challenge is the tendency to attribute a new symptom to teething without considering alternative causes. This tendency arises for several reasons. Teething is a common and visible process, the parents are often aware of it, and the symptoms it produces overlap with those of many common illnesses. A clinician who has heard the explanation from the parents may accept it without a systematic assessment. Over time, this can lead to premature reassurance and to delayed diagnosis.

The most important alternative causes can be grouped by the symptoms they produce. Fever with irritability in an infant may indicate a urinary tract infection, otitis media, pneumonia or a bacterial infection, and in young infants a serious bacterial infection must be excluded. Fever with oral ulcers and gum inflammation suggests herpetic gingivostomatitis, which is caused by herpes simplex virus and is a common cause of painful gums in toddlers. Diarrhea and vomiting point to gastroenteritis, which may cause dehydration and requires assessment of fluid status. Fever with a rash, lethargy or poor feeding requires a search for infection with a systemic character.

To illustrate this reasoning, consider a constructed example. A nine-month-old infant has been irritable for two days, has increased drooling and a swollen lower gum, and has a temperature of 38.6 °C. The parents attribute the fever to teething. The clinical approach should not accept this explanation automatically. The clinician should check hydration, examine the ears, throat and mouth for ulcers, assess the chest and urine output, and determine whether the child is feeding and waking normally. If the examination shows a focus of infection or the child is unwell, the teething explanation should be set aside. The example is hypothetical and is included only to illustrate the reasoning process.

The fever threshold itself deserves attention. A temperature of 38.0 °C or above is generally regarded as fever in infants and children, and the method of measurement matters. Low-grade temperature readings taken from the axilla are less reliable than rectal readings, and a child with a borderline reading should be re-examined rather than dismissed. For infants under three months, any fever should be evaluated promptly, regardless of the teething history.

MANAGEMENT TACTICS

Management of teething should begin with reassurance and with non-pharmacological measures. Cold objects, such as a chilled teething ring, can ease gum discomfort by reducing local sensation, and they avoid the risks of medicated products. Gentle pressure on the gum, for example with a clean finger, may also relieve discomfort, and hard objects that are safe for the child to hold can be offered. Parents should avoid teething necklaces and bracelets, which present a choking and strangulation risk and have no proven benefit.

Pharmacological relief should be chosen with caution. Topical benzocaine, which is a local anesthetic found in many over-the-counter teething gels and liquids, has been the subject of safety warnings. In June 2018 the United States Food and Drug Administration warned that over-the-counter oral products containing benzocaine should not be used to treat teething in children under two years of age, and stated that it would take regulatory action against noncompliant products [4]. The concern is methemoglobinemia, a condition in which the blood cannot carry oxygen effectively. Symptoms include pale or grey lips and nail beds, shortness of breath, fatigue and a rapid heart rate, and the condition can be fatal. The FDA had issued an earlier warning about benzocaine gel products in 2006, and reported that a substantial proportion of the methemoglobinemia cases associated with these products occurred in children under two [4].

Systemic analgesics may be used for severe discomfort, but they should be dosed by body weight and used for a limited period, and they must not be allowed to mask the signs of an underlying illness.

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.

Parents should be instructed to measure temperature accurately, record the timing of symptoms, and seek medical review if the fever persists, if the child is unusually drowsy, or if feeding or urine output falls. These instructions convert the parental explanation into a monitored plan rather than a reason to delay care.

A practical sequence for the clinician is useful in primary care. First, the history should establish the age of the infant, the onset and duration of each symptom, the child's feeding and urine output, and any contact with sick people or recent vaccination. Second, the examination should include temperature measurement by a reliable method, assessment of hydration, inspection of the ears, mouth, throat and skin, and examination of the chest. Third, the clinician should decide whether the infant can be managed at home. Infants who are well apart from local gum symptoms can usually be managed at home with reassurance. Infants with fever, poor feeding, reduced urine output, lethargy or any sign of dehydration should be referred for further assessment.

RESULTS AND DISCUSSION

The review supports three main conclusions. The first is that the local features of eruption, namely gum irritation, irritability and drooling, are the best-supported manifestations of teething [1]. These features can be recognized in most infants and can be managed without medication. The second is that fever and diarrhea are not reliably explained by teething, and the evidence for a causal link is weak [2], [3]. The third is that the attribution of systemic symptoms to teething is itself a risk, because it can delay the diagnosis of infection and the treatment of dehydration.

These conclusions have practical implications for primary care. A clinician who encounters an infant with fever or diarrhea and a history of teething should use the teething history as one piece of information rather than as the explanation. A structured assessment, including hydration, examination of the ears, mouth and chest, and a judgement about the child's general condition, should precede any conclusion. When this assessment does not reveal another cause, the child may be managed for teething with clear advice and a plan for review. Parents should be given specific criteria for returning to the clinic, so that the decision to seek review does not depend solely on their interpretation of the symptoms.

The discussion also highlights the importance of communication with parents. Many families hold a strong belief that teething causes illness, and this belief may be reinforced by older advice, by family experience and by products marketed for teething relief. A clinician who dismisses this belief may lose the family's trust, while one who accepts it without examination may miss a serious illness. The most effective approach is to acknowledge the discomfort that teething causes, explain which symptoms are expected, and clearly state which symptoms require review.

Parental counseling deserves particular attention. Parents should understand that teething causes discomfort and that some irritability and disturbed sleep are expected during eruption. They should also understand that a fever, persistent diarrhea or a child who is less active than usual is a reason to seek review rather than a normal feature of teething. Written advice that lists the warning signs, such as a rectal temperature of 38.0 °C or above, poor feeding, fewer wet nappies, or unusual drowsiness, helps parents act in time without relying on memory during a stressful episode.

The study has limitations. The review is narrative and draws on a limited number of sources, several of which report parental observations rather than clinical examinations. The evidence on diarrhea and fever is weaker than the evidence on local signs, and the illustrative case is hypothetical. The recommendations are therefore intended as a reasoned framework for clinical judgement, not as a substitute for local guidelines. Future research should include prospective studies with standardized

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.

examinations, measurement of temperature by a defined method, and follow-up of children who present with systemic symptoms during the teething period.

CONCLUSION

Teething is a normal process that produces local symptoms in most infants, but it does not reliably cause fever, diarrhea or other significant systemic illness. The attribution of such symptoms to teething is a common source of diagnostic error, which can delay the treatment of infection and dehydration. A structured diagnostic approach, in which teething is considered only after alternative causes have been excluded, is therefore essential. Non-drug measures should be the first line of management, and topical benzocaine products should not be used in children under two years of age. Clinicians and parents should work together to recognize the expected features of teething and the warning signs that require urgent review.

REFERENCES

1. Massignan C. et al. [full title to be verified] // Pediatrics. 2016. Available at: [to be verified] (accessed 29.10.2026).
2. [Title to be verified]. South African Dental Journal. 2020. Vol. 75, No. 2. Available at: https://scielo.org.za/pdf/sadj/v75n2/07.pdf (accessed 29.10.2026).
3. [Title to be verified]. Journal of Clinical Pediatric Dentistry (JOCPD). 2025. Available at: https://www.jocpd.com/articles/10.22514/jocpd.2025.122 (accessed 29.10.2026).
4. U.S. Food and Drug Administration. Warning on over-the-counter oral products containing benzocaine for teething in children under two (June 2018). Reported in: ABC News. Available at: https://abcnews.com/news/story/fda-warns-dont-children-sink-teeth-benzocaine-55414986 (accessed 29.10.2026).

© 2026 London International Monthly Conference on Multidisciplinary Research and Innovation. All Rights Reserved.