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Teething induced fever in a 9-month old child: a case report

HARUNA I. DIKA[1*], SHABANI IDDI[1] and NEEMA KAYANGE [2,3]
[1] *Department of Physiology, Weill Bugando School of Medicine, Catholic university of Health and Allied Sciences, P. O. Box 1464, Mwanza, Tanzania*
[2] *Department of Pediatrics and Child Health, Bugando Medical Center, Mwanza, Tanzania*
[3] *Department of Pediatrics and Child Health, Weill Bugando School of Medicine, Catholic university of Health and Allied Sciences, Mwanza, Tanzania*

Abstract
The association between teething and fever has attracted considerable interest because studies have reported controversial results. These discordant results have posed a challenge in the management of fever occurring during teething. The objective of this paper is to supplement previous studies which showed association between teeth eruption and fever and highlight mismanagement of teething induced fever. A 9-month old baby girl presented with fever during teeth eruption. Despite of no malaria parasites seen on blood slide and lack of features and laboratory investigations suggestive of urinary tract infection or bacteremia, the child was treated with antimalarial drugs and prescribed antibiotics. This case study demonstrates that unrecognized teething induced fever leads to unnecessary use of anti-malarial drugs and antibiotics. We recommend paediatricians to consider teething as one of the causes of fever among children.

Keywords: Teething fever, child, management, Tanzania

Introduction

The association between teething and fever has attracted considerable interest because studies have reported controversial results (Jaber *et al.*, 1992; Wake *et al.*, 2000). For instance, a prospective cohort study in Israel found an association between fever and teeth eruption (Jaber *et al.*, 1992), but a similar study among 6–24 months old children in Australia, failed to confirm the association (Wake *et al.*, 2000). Paediatricians agree that fever and other systemic disturbances such as diarrhoea frequently do occur during teething but most of them consider the occurrence as coincidence or due to change in eating behaviour or stress and infections (Coreil *et al.*, 1995). While current paediatric teaching and some studies have failed to recognize the existence of an association between fever and teething (Leung, 1989; Kliegman *et al.*, 2007), lay persons and some medical personnel strongly believe that teething causes fever (Coreil *et al.*, 1995; Wake *et al.*, 1999). These controversial study results and conflicting views pose a challenge in the management of fever occurring during teething since an accurate treatment depends on understanding the cause of the disorder. Here we present a case, which may suggest a link between teething and fever. This case study complement previous studies which showed association between teeth eruption and fever and highlight mismanagement of teething induced fever.

Case

A 9-month old baby girl presented to Al-Jumaa Heath Centre, Mwanza, Tanzania, with a history of high grade fever, loss of appetite, restless and diarrhoea (passing loose stools 7 times per day)

* Correspondence E-mail: hdika2001@yahoo.co.uk

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for one day. The child was febrile (axillary temperature, 38.2°C) and weighed 9.5 kg. The child did not have any tooth and there was no other remarkable finding on physical examination. Upon investigations, no malaria parasites were observed under microscopic examination and malaria antigen (rapid diagnostic) test was negative. Urinalysis showed yellow urine, White Blood Cells sedimentation of 2-10 per high power field. Neither cysts nor trophozoids were seen in stool analysis. Despite of negative malaria tests, the child was covered on artemether and lumefantrine (1 tablet start, then second tablet after 8 hours followed by 1 tablet twice daily for next 2 days), paracetamol 125 mg thrice daily and oral rehydration solutions. The mother was advised to breast feed the child more often.

On the third day, the child continued to have episodes of high fever and diarrhoea. The child was returned to hospital where blood and urine were collected for further investigations Full blood picture as well as blood and urine culture were performed. After blood and urine collection, the patient was prescribed Metronidazole 125mg thrice daily for 5 days. Full blood picture showed haemoglobin concentration of 11 mg/dl, white blood cell count of 6.45 million per microliter (neutrophils 60.0%, eosinophils 2.7%, basophils 0.5%, monocytes 7.1%, and lymphocytes 29.7%). No bacteria growth was observed in either blood or urine culture. Despite of these negative laboratory findings, the patient continued to have fever and diarrhoea and the mother hesitated to give her medication (metronidazole). On the fourth day, the mother noticed a pair of lower central incisor teeth erupted and on the fifth day, the child had neither fever nor diarrhoea.

A month later, the child experienced similar symptoms for 3 days before eruption of the upper central incisor teeth. This time, the child was given paracetamol syrup only, and symptoms subsided after teeth eruption. Although viral infections were not ruled out when the child had fevers which were followed by teeth eruption, the two coincidences of teeth eruptions preceded by fever suggests a likelihood that teething is associated with fever.

Discussion

While a number of paediatricians and other scholars consider systemic signs such as fever during teeth eruption to be merely coincident with period of teething (Wake *et al.*, 2000; Wake & Hesketh, 2002; Cunha *et al.*, 2004; Kiran *et al.*, 2011), the current case suggests that teething induces fever. The timing of fever and other symptom presented with, and their disappearance relative to first teeth eruption and lack of evidence of other causes of the fever strongly suggest that fever and other systemic disturbances in the present case were due to teething. Observation of this case study is in agreement with the prospective cohort study among apparently healthy infants which demonstrated an association between teething and fever (Jaber *et al.*, 1992).

Tooth eruption is associated with many histological changes along the eruption pathway (Yoo *et al.*, 2011). Gingival inflammation has been considered one of the clinical manifestations most commonly associated with teething (Oziegbe *et al.*, 2009). Examinations of histological tissues have demonstrated that teething process is associated with a progressive inflammatory reaction in the periodontal tissue which causes soreness and swelling of the gums before tooth eruption (de França Landim *et al.*, 2013). The fever occurring during teething is an integral part of the acute inflammatory reaction of teething process and is produced by cytokines (Shapira *et al.*, 2003; Silveira & Procianoy, 1998). Cytokines are small protein signalling molecules, which are known to induce fever (Krause *et al.*, 1997). Cytokines whose levels in the circulation have been observed to increase during teething include interleukins (IL-1α, IL-1β) and tumour necrosis factors α [TNFα] (Shapira *et al.*, 2003). Usually, cytokines stimulate production of prostaglandin E2 (PGE2) by the glial cells and endothelial cells by inducing the cyclooxygenase 2 (Elmquist *et al.*, 1997). PGE2 alters the activity of thermo-sensitive neurons of the thermoregulatory centre of the

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pre-optic area in the hypothalamus to induce fever whereby it stimulates cold-sensitive neurons and inhibits heat-sensitive neurons (Shibata & Blatteis, 1991).

Conclusion

This case study demonstrated that teething is associated with fever. This case also shows that teething induced fever can cause unnecessary use of anti-malarial drugs and antibiotics. Indiscriminate use of anti-malarial drugs and antibiotics is likely to be practiced among children aging 6–20 months with teething fever. Though not all children are affected by teething induced fever, we appeal for the health care workers to consider teething as one of cause of fever among children at this age group.

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Declaration of interest

There is no conflict of interest that could be perceived as prejudicing the impartiality of the case reported.

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