Teething Problems and the Influence of Microbial Infections

Introduction

Teething is a normal developmental stage in children between the ages of 6 months to 2 years. It is a significant landmark in the life and growth of a child. Like pregnancy and child birth, it is a thing of joy. Among the Igbos of south eastern Nigeria, it is celebrated hence the first person to see and announce that a child has developed tooth constitutes major challenge for mothers and their babies. A good knowledge of teething and teething problems help the mother and child get through it without much challenges.

Keywords: Teething, Problems, Infections
According to Deb Lonzer, Chairperson, department of community pediatrics, Cleveland Clinic Children’s Hospital, “No more than a third of babies has any one symptom” [2].

Mothers, nurses and midwives regard teething problems as major health challenge and adopt different measures to manage them. Dentists and Paediatricians believe the problems are caused by other factors such as malaria, gastrointestinal tract infections, etc. There is paucity of research information on teething problems. Available reports [1,5,6] dealt more on traditional recognition and management of teething problems. The present study was designed to assess the attitudes and management approach of mothers towards teething problems as well as laboratory diagnosis of common problems associated with teething in Imo State.

Materials and Methods

Study area

This study was carried out in 16 Primary Health Centres selected from 14 Local Government areas within Owerri and Orlu zones of Imo State, south eastern Nigeria. Imo State situates on the latitude $5^\circ\ 29'$ N and $7^\circ\ 2'$ E. It comprises of three geopolitical zones: Owerri, Orlu and Okigwe. Owerri is the capital city and comprises of 9 Local government Areas. Orlu zone comprises of 12 Local government Areas.

Selection of respondents and administration of questionnaires

Four hundred and thirty eight nursing mothers aged 20 to 35 years were recruited from 14 Local Government Areas of Imo State. The objectives of the study were explained to them. Their consent and willingness to participate in the study was sought for. Those who indicated interest to participate were given the research questionnaire to read and complete on the spot. Those who could not write were assisted by nurses and midwives at the primary health centres who acted as field assistants in the research.

Collection of samples

After completing and returning the questionnaires, the mothers were given sterile specimen bottles to collect stool samples from their teething babies. The nurses and midwives assisted to collect 1ml of blood from the babies using sterile needles and anticoagulant vacutainers. The blood and stool samples were labeled and carried with the questionnaires to the microbiology laboratory Imo State University Teaching Hospital Orlu for analysis.

Microbiological analysis of the samples

The blood samples were examined for malaria parasites using Quantitative bulky cost (QBC) and microscopic examination of stained blood films stained with Giemsa stain as in [7,8].

The stool samples were examined for gastrointestinal tract parasites using microscopic examination of direct wet mount and stool concentration techniques as in [7,8].

Statistical analysis

Data obtained from the study were analyzed statistically using simple percentage and two way ANOVA as in [9].

Results

Four hundred and thirty eight mothers with teething children were recruited for the study. Table 1 summarized their occupation and educational background. As shown, 22 (5.0%) were non - working housewives, 125 (28.5%) were civil servants, 134 (30.6%) were artisans and 153 (34.9%) were traders. Also, 15 (3.4%) had no formal education, 96 (21.9%) completed primary school, 188 (42.9%) completed secondary school and 139 completed tertiary schools.

All the mothers had children presenting with one teething problem or the other. Table 2 summarized the problems presented by the respondents. As shown, out of 438 children presented in the study, 38 (8.7%) presented with excessive salivation, 39 (8.9%) presented with vomiting, 40 (9.1%) presented with loss of appetite, 44 (10%) presented with halitosis, 61 (13.9%) presented with gingival inflammation, 71 (16.2%) presented with irritability, 81 (18.5%) presented with itching gingival, 102 (23.3%) presented with fever and 106 (24.2%) presented with

<table>
<thead>
<tr>
<th>Study Area</th>
<th>Number of mothers Exam</th>
<th>Educational Background</th>
<th>Occupation</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>No Academic Qualification</td>
<td>Primary</td>
</tr>
<tr>
<td>Owerri Municipal</td>
<td>35</td>
<td>-</td>
<td>6</td>
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<tr>
<td>Owerri West</td>
<td>32</td>
<td>2</td>
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<td>Owerri North</td>
<td>31</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Mbaitoli</td>
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<td>-</td>
<td>5</td>
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<tr>
<td>Ikeduru</td>
<td>33</td>
<td>2</td>
<td>7</td>
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<tr>
<td>Ngor Okpala</td>
<td>34</td>
<td>3</td>
<td>9</td>
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<td>Orlu</td>
<td>37</td>
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<td>Orsu</td>
<td>25</td>
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<tr>
<td>Oru East</td>
<td>28</td>
<td>2</td>
<td>8</td>
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<tr>
<td>Oru West</td>
<td>31</td>
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<tr>
<td>Nkwerre</td>
<td>33</td>
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<td>5</td>
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<td>Njaba</td>
<td>30</td>
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<td>Isu</td>
<td>27</td>
<td>1</td>
<td>7</td>
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<tr>
<td>Nwangele</td>
<td>25</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>438</td>
<td>15 (3.4)</td>
<td>96 (21.9)</td>
</tr>
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Table 1: Educational Background and Occupation of Mothers of children presenting with Teething Problems.
The most common teething problem presented by the respondents was diarrhea (24.2%) followed by fever while the least was vomiting (8.9%).

Table 3 summarized the pre-clinical practices adopted by the mothers before reporting to hospitals. As shown, 24 (5.5%) mothers adopted use of teething soap, 29 (6.6%) used herbal remedies, 67 (15.3%) rubbed fingers on the gums of their babies, 74 (16.8%) took their babies direct to hospitals, 80 (18.3%) applied teething powder, 81 (18.5%) administered analgesic drugs and 83 (18.9%) adopted teething mixture. The most common practice adopted by mothers in management of teething problems in Imo State is self-medication using teething mixture (18.9%), analgesic drugs (18.5%) and teething powder (18.3%).

Laboratory examination of blood samples collected from teething children presenting with the different problems (Table 4) showed that 121 (27.6%) had malaria parasites. Analysis of the intensity of parasitaemia amongst the children showed that 41 (9.4%) had 1 - 2 parasites per high power field of the blood film, 64 (14.6%) had 3 - 4 parasites per high power field and 16 (3.7%) had > 5 parasites per high power field. Analysis of the data using ANOVA showed strong positive correlation ($p < 0.05$) between the number of children presenting with fever and those infected with *Plasmodium* parasites.

Laboratory examination of stool samples from the children presenting with different teething problems (Table 5) showed that 10 (2.3%) were infected with *Shigella dysentriae*, 34 (7.8%) were infected with *Salmonella* species, 80 (18.3%) were infected with *Escherichia coli*, 60 (13.7%) were infected with intestinal helminthes and 69 (15.8%) were infected with intestinal protozoa. Analysis of the data using ANOVA showed strong positive correlation ($p < 0.05$) between the number of children presenting with diarrhea and those having intestinal parasitic infections.

Relating the prevalence of microbial infections to teething problems presented (Table 6), out of 102 teething children that had fever, 1 (0.98%) had intestinal helminthes infection,
Study Area | Number of Children Examined | Number Negative | Number Positive or Malaria Parasites | Total Infected with Malaria Parasites
---|---|---|---|---
Owerri Municipal | 35 | 22 | 6 5 2 | 13
Owerri West | 32 | 23 | 4 4 1 | 9
Owerri North | 31 | 22 | 2 5 2 | 9
Mbaite | 37 | 26 | 3 6 2 | 11
Ikeduru | 33 | 26 | 2 4 1 | 7
Ngor Okpala | 34 | 25 | 2 5 2 | 9
Orlu | 37 | 26 | 5 4 2 | 11
Orsu | 25 | 20 | 2 3 0 | 5
Oru East | 28 | 21 | 3 4 0 | 7
Oru West | 31 | 21 | 3 6 1 | 10
Nkwerre | 33 | 22 | 4 5 2 | 11
Njaba | 30 | 21 | 2 6 1 | 9
Isu | 27 | 22 | 1 4 0 | 5
Nwangele | 25 | 20 | 2 3 0 | 5
Total | 438 | 317 | 41 64 16 | 121 (27.6)

Note: ppHF = Parasites per High Power field (p < 0.05)

Table 4: Examination of Blood samples of Children with Teething Problems for Malaria Parasites.

Study Area | Number of Children Examined | Number Infected (%) | Bacteria | Protozoa
---|---|---|---|---
Owerri Municipal | 35 | 6 3 | Escherichia coli | 3 6
Owerri West | 32 | 7 2 | Salmonella species | 4 5
Owerri North | 31 | 5 4 | Shigella dysenteriae | 3 6
Mbaite | 37 | 6 3 | Staphylococcus aureus | 4 5
Ikeduru | 33 | 7 2 | Plasmodium | 6 6
Ngor Okpala | 34 | 9 3 | | 5 7
Orlu | 37 | 6 2 | | 5 4
Orsu | 25 | 3 2 | | 4 5
Oru East | 28 | 5 2 | | 4 4
Oru West | 31 | 6 3 | | 5 3
Nkwerre | 33 | 4 2 | | 3 4
Njaba | 30 | 5 3 | | 6 4
Isu | 27 | 4 2 | | 4 5
Nwangele | 25 | 3 1 | | 4 3
Total | 438 | 80(18.3) 34(7.8) | 10(2.3) 11(2.5) | 60(13.7) 69(15.8)

(p < 0.05)

Table 5: Examination of Stool samples of Children with Teething Problems for Intestinal Parasites.

Teething Problem | Number Examined | No Microbial Infection | Microbial Infection (%) | Intestinal Protozoa | Intestinal worm | Plasmodium parasites
---|---|---|---|---|---|---
Fever | 102 | 0 | 36 (35.3) | 2 (1.9) | 1 (0.98) | 89 (87.3)
Irritability | 71 | 18 | 12 (16.9) | 13 (18.3) | 16 (22.5) | 12 (16.9)
Itching Gingival | 81 | 47 | 12 (14.8) | 22 (27.2) | - | -
Gingival Inflammation | 61 | 51 | 10 (16.4) | - | - | -
Diarrhoea | 100 | 14 | 46 (46.0) | 33 (33.0) | 7 (7.0) | -
Vomiting | 39 | 17 | 5 (12.8) | 17 (43.6) | - | -
Haltosis | 44 | 30 | 9 (20.5) | 5 (11.4) | - | -
Loss of Appetite | 40 | 13 | 7 (17.5) | 7 (17.5) | 13 (32.5) | -
Excessive Salivation | 38 | 25 | 3 (7.9) | 4 (10.5) | 6 (15.8) | -
Total | 576 | 215 | 135 (30.8) | 69 (15.8) | 60 (13.9) | 121 (27.6)

(p<0.05)

Table 6: Relationship between Teething Problems and Microbial Infections.

2 (1.9%) had intestinal protozoa infections, 36 (35.3%) had bacterial infection and 89 (87.3%) had Plasmodium parasites infection. Out of 71 teething children presenting with irritability, 12 (16.9%) had bacterial infection, 12 (16.9%) had Plasmodium
parasites infection, 13 (18.3%) had intestinal protozoa infection, and 16 (22.5%) had intestinal helminthes infection. Out of 100 teething children presenting with diarrhea, 7 (7%) had intestinal helminthes infection, 38 (38%) had intestinal protozoa infection and 55 (55%) had bacterial infection. Analysis of the data using ANOVA showed strong positive correlation (p < 0.05) between different teething problems presented by respondents and types of infections diagnosed.

The emergence of the first tooth or set of teeth in the early stage of life in humans referred to as teething, is generally associated with common signs such as drooling, swollen or bulging gums, a tooth visible below the gum, irritability, trouble sleeping, trying to bite, chew, and suck on everything, rubbing of face, rejecting food and grabbing of ears [2]. Many mothers believe that teething is a physiological process that is normally accompanied by minor problems that cannot be prevented but the intensity can only be reduced [1]. The mothers in the present study seem to disagree with this because they all resorted to one practice or the other to provide remedy for their child's teething problem. These symptoms entail discomforts that last for just a few days, or for as long as several months if a lot of teeth come through all at once. In a few children, teething does not cause any noticeable signs at all. In the present study, all the teething children exhibited one teething problem or the other such as excessive salivation, vomiting, loss of appetite, halitosis, gingival inflammation, irritability and itching gingival. Although these signs suggest that a baby may be teething, it is also very likely that something else may be wrong with the child.

Teething signs differ from one child to another and cause much pain with different experience for every child. Parents resort to different practices and measures to combat teething problems. The measures adopted by mothers in the present study: use of teething soap, use of herbal remedies, rubbing fingers on the gums of their children, use of teething powder, use of analgesic drugs and teething mixture, etc. are similar to those adopted by mothers in a previous studies [4]. While agreeing that the use of oral over-the-counter pain relievers such as acetaminophen (Tylenol) or Ibuprofen provide relief of symptoms, previous reports [6] cautioned that topical medications containing benzocaine may cause serious and potentially lethal side effects and should not be used to treat teething symptoms. Similarly, other workers [4] reported that acetaminophen and ibuprofen are good bets for temporary pain relief, as are topical oral anesthetics, as long as the recommended dosage is no exceeded, but advised that the practice of self-medication should be avoided, rather if a child has a rectal temperature of 101 degrees F or higher and symptoms such as lethargy, lack of appetite, vomiting, or diarrhea, the child's healthcare provider should be consulted.

The findings of this study strongly suggest that majority of the ailments presented as teething problems are caused by microbial infections resulting from poor hygiene and poor environmental sanitation. Ailments such as diarrhea, fever, or runny nose in teething babies, should not be dismissed as a sign of teething, especially if the symptoms last longer than 24 hours. Although many parents and midwives / nurses insist that these symptoms are directly related to child's teething, but there's no scientific proof that they are linked. Excessive drooling is a normal developmental stage of infancy, so one need not assume that drooling means teething. There is no way to prove that a child’s saliva is the result of teething or not. Tooth eruption tends to come in stages, with more activity at night than during the day, so a baby may be more irritable then. Tugging can be a symptom of teething or a sign of an ear infection. The pain from the jaw gets transferred to the ear canal. The present study revealed that of all the teething children presenting with fever, many had Plasmodium parasites infection. Plasmodium parasites are the causative agents of malaria. One major symptom associated with malaria is fever. It is not unlikely that cases of fever reported by many mothers in this study are due to malaria and not due to teething. Amongst teething children presenting with diarrhea in this study, many had bacteria and intestinal protozoa infections. These bacteria and protozoas are known to cause gastroenteritis in both adults and children. These findings agree with previous reports [2] which reported that experts, including those at the American Academy of Paediatrics, say fever and diarrhea are not normal teething symptoms. One of many possible explanations for these symptoms is that because teething children frequently put things in their mouth to soothe their gums, they get sick from coming into contact with viruses and other microbes that cause infections. Previous reports [6] while agreeing with symptoms of teething to include irritability, tender and swollen gums, and the infant wanting to place objects or fingers into the mouth in an attempt to reduce discomfort, maintained that fever, cough, diarrhea, and cold symptoms are not associated with teething in children.

Conclusion

Teething problems are real and constitute a major public health challenge in Nigeria. Some ailments in teething babies regarded as teething problems e.g. fever and diarrhea are not associated with teething, rather they are caused by microbial infections such as plasmodiosis, bacteria and intestinal parasites infections. Most practices adopted by mothers to manage teething problems are erroneous and should be discouraged. Improved sanitation, personal hygiene and careful monitoring of teething children will help reduce the occurrence of many health challenges observed amongst teething children in Nigeria.

Acknowledgements

We acknowledge the assistance and contributions of Staff Nurse Phileomena Agbhubue and Dr. Eberendu both of Paediatrics Department, Imo State University Teaching Hospital Orlu, Dr. Oluchi, Department of Dentistry, Imo State University Teaching Hospital Orlu and the Medical Laboratory scientists in the Department of Microbiology and Parasitology, Imo State University Teaching Hospital Orlu.

References


