Prevalence of Malaria Amongst Children 0 - 4 Years in Olugbo, Odeda Local Government, Ogun State, Nigeria


Abstract Malaria remains the most important cause of childhood mortality and morbidity and accounted for 63.4% of all reported diseases in Nigeria. The present study is aimed at determining in the prevalence of malaria amongst children 0 - 4 years in Olugbo, Odeda Local Government, Ogun State, Nigeria. Olugbo, the study area is a rural community that consists of fifteen (15) adjoining rural villages, Obosokoto, Idi-obi, Eleta, Aralamo, Akide, Yakoyo, Ogbonsode, Olugbo, Alagbayun, Ilafi, Iyanbu, Koku, Gbagura, Aariku, Idi-oimo, villages. A total of two hundred children 0-48 months were recruited for the purpose of this study. Two millilitres of blood samples were collected by vernipuncture. The blood samples were then preserved with an ice pack in a cold box before examination and was analysed using the Quantitative Buffy Coat analyser. The overall prevalence of malaria infection in the present study is 63.0%. The prevalence of infection across the age group is 37.74%, 77.63%, 76.74% and 50.0% for children aged 0-12, 13-24, 25-36 and 37-48 months respectively. A significant difference (p<0.05) exists between malaria infections across the age group of the children enrolled into the study. Free malaria diagnosis and treatment is recommended for children under five years of age.

Keywords Malaria; Children; Prevalence; Morbidity; Ogun State; Nigeria

Introduction Malaria is an infectious disease caused by a one-cell parasite of the genus Plasmodium, transmitted from person to person mainly through a bite of a female Anopheles mosquito, which requires blood meal to nurture her eggs (WHO, 1997). The female Anopheles mosquito is the vector for human malaria and bites man mostly from 5 pm to 7 am, with maximum intensity between 10 pm and 4 am. This provides the basis for the use of mosquito bed net/insecticide treated nets (ITNs), when at sleep and when mosquito is most active (Afari, E.A; Appawu, A; Dunyo, S; Baffoe-Wilmot, A; Nkrumah, F.K., 1995).

There are four species of the human malaria parasites responsible for human malaria. These are Plasmodium falciparum, P. ovale, P. malariae and P. vivax. Of the four species, Plasmodium falciparum is the most virulent and the most common in Africa particularly sub-Saharan Africa accounting in large part for extremely high mortality in this region (WHO, 1987). The transmission of the Plasmodia is facilitated through the bite of the vector, the female Anopheles mosquitoes.

Anopheles gambiae is the most efficient vector of Plasmodium in Africa and it has been estimated that a single female Anopheles mosquito in every six houses is sufficient to maintain transmission in a community (Lines, 1996). The clinical features of a malarial attack or paroxysm consist of shaking chills, fever (up to 38°C or higher) and generalized weakness followed by a resolution of fever. The paroxysm occurs over 6 to 10hours and is initiated by the synchronous rupture of erythrocytes with the release of new infectious blood stage forms known as merozoites (Miller et al., 1976).

The main symptom of malaria is fever. Depending on factors including level of immunity, species of parasite, and access to appropriate treatment, some cases develop severe disease and complications and many of these without appropriate treatment result in death (Waller et.al., 1991). In Nigeria, malaria is a major cause of morbidity and mortality. It is endemic
throughout the country with seasonal variation in different zones of the country.

At least 50% of the population suffers from at least one episode of malaria each year. The disease is the commonest cause of outpatient attendance across all age groups. The results of the most comprehensive study of the malaria situation in Nigeria conducted across the six geographical zones in Nigeria have signified the public health importance of malaria (FMOH, 2001). The study confirmed that malaria is a major cause of morbidity and mortality especially among vulnerable groups including women and children less than five years.

The incidence of malaria among the under five across the six geographical zones during the study were as follows: South-South 32.7%, South-West 36.6%, South-East 30.7%, North central 58.8%, North East 55.3% and North West 33.6% (FMOH, 2001). The present study is aimed at determining the prevalence of malaria amongst children 0-4 years in Olugbo, Odeda Local Government, Ogun State, Nigeria.

Methodology

Study area

This study was carried out in Olugbo community of Odeda Local Government Area (Ogun State) situated in the South – western part of Nigeria and covers a landmass of 16,370 square kilometres. The state lies between longitude 2° 45’E and 3° 55’E and latitude 7° 01’N and 7° 18’N. The state has an annual rainfall of 1206.70mm, and a mean annual temperature range of 22.8°C – 34.9°C.

Olugbo, the study area is a rural community that consists of fifteen (15) adjoining rural villages, Obosokoto, Idi-obi, Eleta, Aralamo, Akide, Yakoyo, Ogbonsode, Olugbo, Alabayun, Ilafi, Iyau, Koku, Gbagura, Aariku, Idi-omo, villages. The study area is characterized by bushes, cultivated and uncultivated farmlands close to human dwelling houses. Crops like cocoyam, banana and pineapple, which have implications on vector population, are readily cultivated. The area is inhabited by the Yoruba speaking tribe of Nigeria, and their main occupation is farming and trading.

Ethical clearance and informed consent

A letter for ethical consideration and a copy of the project proposal was written and forwarded to the ethical committee in the Ministry of Health, Oke Ilewo, Abeokuta, Ogun state. An Ethical clearance to undertake the study was obtained from the ethical committee in the Ministry of Health. Permission to use the community for the study was obtained from the village Head, and informed consent was obtained from the mothers/caregivers of children under five years of age before they were enrolled into the study.

Study population

The study population consists of children under five years. A total of two hundred children 0-48 months were recruited for the purpose of this study.

Blood sample collection

Two millilitres of blood samples were collected by venipuncture. This was done with the assistance of a registered laboratory technologist, under the supervision of a Medical Doctor (Paediatrician), from the Federal Medical Centre (FMC). The blood collection was done by placing a tourniquet around the upper arm and tightened sufficiently to increase blood pressure and prevent venous return. The upper arm of the area of the venipuncture was thoroughly cleaned and sterilized using cotton wool soaked in methylated spirit. Venous blood was collected from the antecubital vein and transferred into a sample tube containing Ethyl-Diamine Tetra-acetic acid (EDTA) and mixed thoroughly to avoid clotting. The blood samples were then preserved with an ice pack in a cold box before examination and analysis at the Parasitology Laboratory, in the University of Agriculture, Abeokuta.

Laboratory examination

The Quantitative Buffy Coat (QBC) technique.

The technique was conceptualized in 1974 by Becton – Dickson, it employs micro haematocrit centrifugation, which is an effective means of concealing haematoparasites (e.g. malaria parasite prior to direct examination. It employs a precisely constructed capillary tube which is internally coated with EDTA and acridine orange.

The intensity of infection is scored as

\[ + = 1 - 10 \text{ parasites per QBC field} \]
\[ ++ = 11 - 100 \text{ parasites per QBC field} \]
\[ +++ = 100 \text{ parasites per QBC field} \]

Results

A total of two hundred (200) children under five years of age were enrolled into the study. A summary of the
socio-demographic characteristics of the respondents (parents/caregivers of the selected children) is presented in Table 1. The study population consist 110 (55.0) males and 90 (45.0%) females of the total study subjects. The ages of the subjects (children under five years) range from 0-59 months. 19.5 % of the children were aged 0-12 months, 26.0% were aged 13-24 months, 22.5% were aged 25-36 months, while 32.0 % were aged 37-48 months.

The overall prevalence of malaria infection in the present study is 63.0%. The prevalence of infection amongst children 0-12 months is 37.74%, while the prevalence of malaria infection in children aged 13 – 24 months, 25 – 36 months and 37 – 48 months is 77.63%, 76.74% and 50.0% respectively. A significant difference (p< 0.05) exists between malaria infections across the age group of the children enrolled into the study. (table 2).

Discussion

The total prevalence of malaria infection in the study population was 63.0%, for a disease like malaria that debilitates; it can be described as very high. These results are similar to those of Aribodor et al., (2003) who had reported 76% prevalence in Azia, Anambra State. This result is also higher than the 40% annual prevalence rate found in Nigeria (FMOH, 2005a). The higher prevalence of malaria among children age group 25 -39 months seen in this study is in line with several studies (WHO, 2005b; Umar and Hassan, 2002; Ukpai and Ajoku, 2001; Salako et al., 1990). Generally, there is slow acquisition of active immunity to malaria (Perlmann and Troye-Blomberg, 2000).

Therefore, it is not surprising the situation is the present study. Children born to immune mothers are protected against the disease during their first half

Table 1 Demographic characteristics of the subjects enrolled into the study

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number (%)</th>
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</thead>
<tbody>
<tr>
<td>Age Range</td>
<td></td>
</tr>
<tr>
<td>0 – 12 months</td>
<td>39 (19.5)</td>
</tr>
<tr>
<td>13 – 24 months</td>
<td>52 (26.0)</td>
</tr>
<tr>
<td>25 – 36 months</td>
<td>45 (22.5)</td>
</tr>
<tr>
<td>37 – 48 months</td>
<td>64 (32.0)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>110 (55.0)</td>
</tr>
<tr>
<td>Female</td>
<td>90 (45.0)</td>
</tr>
</tbody>
</table>

Table 2 Prevalence of malaria infection across the age groups of the children examined

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Total examined</th>
<th>Malaria positive (%)</th>
<th>Malaria negative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>53</td>
<td>20(37.74)</td>
<td>33(62.26)</td>
</tr>
<tr>
<td>13-24</td>
<td>76</td>
<td>59(77.63)</td>
<td>17(22.37)</td>
</tr>
<tr>
<td>25-36</td>
<td>43</td>
<td>33(76.74)</td>
<td>10(23.26)</td>
</tr>
<tr>
<td>37-48</td>
<td>28</td>
<td>14(50.0)</td>
<td>14(50.0)</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>126(63.0)</td>
<td>74(37.0)</td>
</tr>
</tbody>
</table>

year of life by maternal antibodies. As they grow older, after continued exposure from multiple infections with malaria parasites over time, they build up an acquired immunity and become relatively protected against disease and blood stage parasites (Plebanski and Hill, 2000) hence lower prevalence of malaria among the older age groups. There is a significant difference (p<0.05) between malaria infection rate across the age groups.

The present study has revealed high prevalence of infection amongst children under five years in Olugbo, Ogun state. Further studies could be undertaken to investigate other epidemiological parameters responsible for the high prevalence rate. Government could reduce the infection rate further by embarking on health education campaigns and training on malaria prevention, particularly educating people on the importance of not providing conducive dwelling places for mosquitoes.

The Government should also embark on extensive vector control to reduce the vector population and should subsidize anti-malarial drugs; children under the age of five years should be given free malaria diagnosis and treatment. It should also provide and distribute insecticide impregnated nets, free, at the State as well as at the Local Government levels to control the malaria scourge. The parents /caregivers of the children should ensure that their child under five years sleep under the impregnated nets every night.

References


FMOH, 2005, National Treatment Guidelines Federal Ministry of Health. Publication of the FMOH, Nigeria, p. 44

http://dx.doi.org/10.1056/NEJM197608052950602
Perlmann P., Troye-Blomberg M., 2000, Malaria Immunology, Perlmann P and Troye-Blomberg M (editors). Basel, Krager, 80: 229-242
http://dx.doi.org/10.1016/S0952-7915(00)00117-5
http://dx.doi.org/10.1097/00019048-199503000-00014
World Health Organisation., 1997, Division of control of Tropical disease WHO Pesticide Evaluation Scheme Chemical methods for are the control of vectors and pest of public health importance