Prevalence of Malaria in Pregnant Women Attending Ante Natal Care at University of Port Harcourt Primary Health Care Centre Aluu, Port Harcourt, Rivers State, Nigeria

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Received 17 July 2013; Accepted 28 August 2013

Abstract. Venule blood samples were randomly collected from eighty pregnant women receiving ante natal care in the University of Port Harcourt Primary Health Care Centre after obtaining ethical clearance. These blood samples were put in EDTA properly designated bottles and taken to the Parasitology Laboratory, Department of Animal and Environmental Biology for examination. The standard thick and thin smears were used to examine the blood specimens. Overall prevalence showed that 72.5% of the pregnant women were infected with malaria. Specific Plasmodium prevalence amongst the infected showed that 63.5% were infected with P. falciparum; 18.9% for P. vivax; 15.5% for P. malariae and 1.7% for P. ovale. There was no statistically significant (P>0.05) increase in the prevalence of Plasmodium species between the primigravidae (58.6%) and the multigravidae (41.3%). The disparity in parasitemia was attributed to pregnancy induced delayed antibody expression in the primigravidae. The study emphasized the significance of health education in malaria control especially during pregnancy.

Key words: Specific Plasmodium prevalence, primigravidae, multigravidae, delayed antibody expression.

1. INTRODUCTION

Malaria control is major challenges in Africa where over 588 million people in the 45 endemic countries are at risk especially children and pregnant women (Newman et al., 2003; WHO, 2008; Agomo et al., 2009). Statistics indicate that Nigeria alone accounts for 45% prevalence in the Africa continent; a fact not far-fetched, when the population of the country is considered (Federal Ministry of Health (FMH), 2000; National Census, 2006; Adefioye et al., 2007). Reports by FMH, (2000) and Agomo et al., (2009) stated that the prevalence of malaria has shown significant reduction in other African countries except Nigeria; a position which presents a gloomy future for malaria eradication in Nigeria amidst the huge efforts by the government and non-governmental agencies at combating the menace.

1.1. Malaria in Pregnancy: A Public Health Challenge in Sub-Saharan Africa

Okpere et al. (2010) stated that pregnancy results in increased incidence and severity of malaria which has been implicated for complications in pregnancy. In sub-Saharan Africa, anaemia, spontaneous abortion, prematurity and stillbirths are common symptoms of the disease. In Nigeria, the disease is a major public health challenge as malaria alone accounts for 11% maternal deaths annually (WHO, 2010; Amoran et al., 2012). However, no matter how alarming these statistics may sound some researchers still express doubts about their accuracy especially on the true status of malaria parasitemia in pregnancy in Nigeria (Eze et al., 2010). This discrepancy is not unconnected with the poor documentation of cases of malaria in pregnancy in health establishments and the attitude of pregnant women in the rural areas patronizing unorthodox health care services (Eze et al., 2010). Experts in epidemiology have identified poor surveillance and poor intervention coverage by the government as a contributory factor to the increase in cases of malaria in Nigeria (Desai et al., 2007; Enato et al., 2007; Okpere et al., 2010; Olurunfemi, 2012).

1.2. Factors that Predispose Pregnant Women to increased Malaria Parasitemia

Several studies have established radical physiological and behavioural changes, such as increased volume of exhaled air, release of increased levels of cortisol and volatile compounds due to increase body temperature that predispose pregnant women to increase in mosquito bites (Lindsay et al., 2000; Martnez-
Espinosa et al., 2000; Bouyou-Akotet et al., 2005; Rogerson and Boeu, 2007 and Enato et al., 2007 and 2009; WHO, 2010. In endemic countries like Nigeria, 20% of malaria parasitemia in pregnancy are asymptomatic, with susceptibility to parasitemia common in primigravidae (Desai et al., 2007; Rogerson et al., 2007, Amoran, 2012). Agomo et al. (2009), stated that amongst the factors identified to increase the risk of malaria infection include; young maternal age (<20years), and gravidity (primigravidae). This problem is further aggravated by the paucity in Primary health facilities and the preference of pregnant women for unorthodox health care providers especially in the rural areas (Nduka et al., 2011; Amoran, 2012; Molina and Gonzalez, 2012). This study is aimed at determining the malaria parasitaeemia in primigravidae and multigravidae pregnant women on ante-natal care programme at the University of Port Harcourt Primary Health Care Centre, Aluu, Rivers State, Nigeria.

2. MATERIALS AND METHODS

2.1. Study Area

The study was carried out at the University of Port Harcourt Primary Health Centre situated at Aluu in Ikwerre L.G.A., Rivers State, Nigeria. The area lies between latitude 5˚ 54 , 295 N and longitudes 6˚, 53, 889 and 7˚E; experiences an average rainfall of 2,500cm³ and temperature range of between 28˚C-30˚C annually which supports the rainforest type of vegetation. The area is sub-urban in structure with about 40% of the populace being predominantly rural artisanal fishermen and subsistent farmers. However, the life style of the indigenes is greatly influenced by the presence of the University of Port Harcourt and several industries.

2.2. Collection of Blood Samples to evaluate Plasmodium spp. Parasitemia

Venule blood samples were randomly collected from eighty pregnant women receiving ante natal care in the University of Port Harcourt Primary Health Care Centre after obtaining informed consent and ethical clearance from the Chief Medical Officer of the centre. These blood samples (20µl of blood) were collected in properly designated EDTA bottles and taken to the Parasitology Laboratory, Department of Animal and Environmental Biology, University of Port Harcourt for examination within 24hours.

The standard thick and thin smears on a single slide were used to examine the blood specimens (Cheesbrough, 2005). Data were analysed with Excel ANOVA.

3. RESULTS AND DISCUSSIONS

In the study the overall prevalence showed that 58 (72.5%) of the sampled pregnant women were infected with malaria. Specific prevalence of Plasmodium amongst the infected showed that P. falciparum was the dominant species in the sampled group (Table 1.). There was no statistically significant (P>0.05) difference in the prevalence of specific Plasmodium species between the primigravidae (85.0%) and the multigravidae (15.0%). However, the primigravidae expressed more specific parasitemia than the multigravidae in the sampled group.

Suppressed immunity due to pregnancy

The study show cases the level of malaria parasitemia in a select group of pregnant women attending ante natal care in a primary health centre in the Niger Delta. In the study, there was high prevalence of malaria parasitemia amongst the examined set (Table, 1) which was in line with several studies including; (Lindsay et al., 2000; Martinez-Espinosa et al., 2000; Bouyou-Akotet et al., 2005; Rogerson and Boeu 2007; Chimere et al., 2009; Enato et al., 2009; WHO, 2010; Olunfemi et al., 2012) where results indicated heavy and multiple species malaria parasitemia in pregnancy. Naturally, indigenes of the study area readily acquire immunity due to repeated exposure to Plasmodium spp. of parasites (Bassey et al., 2007; Rogerson et al., 2007; Amoran et al., 2012), which declines as pregnancy set-in. (Amoran, 2012; Molina and Gonzalez, 2012). This decline in immunity could be attributed to physiological and behavioural changes that result to increase in the levels of cortisol and volatile compounds that make pregnant women more attractive to infected female anopheles mosquito (Lindsay et al., 2000; Martinez-Espinosa et al., 2000; Bouyou-Akotet et al., 2005; Rogerson and Boeu 2007 and Enato et al., 2009; WHO, 2010; Molina and Gonzalez, 2012). Another factor that may have impacted on the disparity in malaria parasitemia is the patronage of alternative ante natal health care providers such as herbalists, and traditional midwifes scattered around the rural areas of Nigeria by pregnant women.
Table 1: Malaria parasitemia in pregnant women attending ante-natal care in primary health centre Aluu, Port Harcourt

<table>
<thead>
<tr>
<th>Primigravidae</th>
<th>Number examined</th>
<th>Number infected (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primigravidae</td>
<td>80</td>
<td>34</td>
<td>20 (34.4)</td>
</tr>
<tr>
<td>Multigravidae</td>
<td>80</td>
<td>24</td>
<td>17 (29.3)</td>
</tr>
<tr>
<td>Overall Total</td>
<td>80</td>
<td>58</td>
<td>37 (63.3)</td>
</tr>
</tbody>
</table>

Plasmodium species

<table>
<thead>
<tr>
<th>Primigravidae</th>
<th>P. falciparum (%)</th>
<th>P. vivax (%)</th>
<th>P. malariae (%)</th>
<th>P. ovale (%)</th>
<th>Overall Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primigravidae</td>
<td>80</td>
<td>34</td>
<td>5 (8.6)</td>
<td>1 (1.7)</td>
<td>34 (58.6)</td>
</tr>
<tr>
<td>Multigravidae</td>
<td>80</td>
<td>24</td>
<td>3 (5.17)</td>
<td>0</td>
<td>24 (41.3)</td>
</tr>
<tr>
<td>Overall Total</td>
<td>80</td>
<td>58</td>
<td>9 (15.5)</td>
<td>1 (1.7)</td>
<td>58 (72.5)</td>
</tr>
</tbody>
</table>

4. CONCLUSION

The study thereby states that the disparity in *Plasmodium* spp. parasitemia between the multigravidae and primigravidae could be attributed to acquired immune-efficiency of the multigravidae to malaria (Martinez-Espinosa et al., 2000; Bouyou-Akotet et al., 2005; Opkere et al., 2010) as parity advances. Depressed immunity due to delayed antibody expression and/or lack of awareness on the necessary preventive measures in pregnancy could also be responsible for the increased malaria parasitemia in the primigravidae (Okwa, 2003; Opkere 2004; Bassey et al., 2007; Agomo et al., 2009). This study buttresses the significance of aggressive awareness campaigns on health education and family planning in the rural settings because effective health education at the grass root level would project the country faster in actualising her millennium development goal of health for all by the year 2020.

Acknowledgements

We appreciate the efforts of the laboratory crew of the Department of Animal and Environmental Biology, University of Port Harcourt and Dr. C.J. Oguebue; the coordinator; Microbiology Technology, Institute of Science Laboratory Technology for his support during the study.

REFERENCES


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Dr. Sidney Obidimma Nzeako graduated from the University of Nigeria Nsukka; B.Sc (Hons) Biology Education, 2003. In 2007 he obtained M.Sc Environmental Parasitology and Ph.D Nematology, (2012) from the University of Port Harcourt. Dr Nzeako has a broad research interest in Environmental Parasitology and Nematology. He has conducted several researches in biological control of parasitic nematodes in economically important animals and crops in Nigeria and has published several articles in professional journals at national and international levels cutting across General Parasitology and Nematology.

Professor Florence O. Nduka is a Professor of Parasitology in the Department of Animal and Environmental Biology of the University of Port-Harcourt. She obtained her Ph.D from the University of Nigeria Nsukka in 1986. Her research interests focuses on epidemiology of major parasitic diseases including Malaria and Schistosomiasis. She has published many refereed articles in reputable journals.