Evaluation of Malaria Infection among Primary School Pupils in Urban and Rural Areas in Ikot Ekpene Local Government Area, Akwa Ibom State Nigeria

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ABSTRACT: Malaria Prevalence was studied among 250 pupils in two selected primary school between May to September 2015. Various blood samples were collected from pupils between the ages of 2 to 13 years. Thick and thin blood smears were prepared stained and examined microscopically for malaria parasites. Structured questionnaires were used to gather socio-demographic data, knowledge, attitude and practices of respondents regarding malaria. Out of 250 pupils examined 193 (77.20%) were infected with plasmodium, St. Theresa's Primary School Ikot Osurua had a higher (71%) prevalence than those of St. Peter's Primary School Ikot Inyang (81.40%). This was statistically significant (P<0.05). More females (82.90%) than males (70.81%) were infected though the difference was not statistically significant (P>0.05). Age groups 5 – 7 years had the highest (84.62%) prevalence, followed by 2 – 4 years (79.41%) than 8 – 10 years (76.19%) while 11 -13 years had the lowest (66.67%). This was not statistically significant. (P>0.05). Responses from questionnaires revealed that most respondents (83%) reported mosquito bites to be the cause of malaria infection, some (9.9%) attributes malaria to oily food while few (5%) reported the cause of malaria to be drinking dirty water. Many of the respondents should have adequate knowledge of the signs and symptoms. Fever (44.5%), dizziness (15.5%), Nausea (11%), cough (10%), vomiting (7.5%) were some of the symptoms reported. Preventive measures adopted by respondents revealed that majority (39%) use mosquito coils, some (31%) use insecticide spray, few (18.5%) use insecticide bed nets while others (11.5%) makes use of mosquito window nets. For treatment and management of malaria, most respondents visit patent medical store, while some ((48.5%) diagnose malaria in children through self-examination and child's complain (10.5%). While very few carry out laboratory tests. This study has shown that knowledge on management and preventive practices on malaria are very low in endemic areas. There is need for public health education programme and awareness for proper control of malaria.

Malaria is a life threatening parasitic disease in man caused by distinct four plasmodium species; *Plasmodium vivax , Plasmodium malariae Plasmodium falciparum* and *Plasmodium ovale*, transmitted through the bite of a female anopheles mosquito (WHO 2009), which acts as a vector while taking a blood meal. Malaria is the leading cause of death and disease is many developing countries where young children and pregnant women are the groups most affected. The number of malaria cases worldwide seems to be increasing due to increasing transmission risk in areas where malaria control has declined, the increase prevalence has indicated drug resistant strains of parasites and a relatively few case, massive increase in international travel and migration (Pasvol 2005). Most adults living in malaria endemic areas have partial immunity and are at risk of chronic or repeated infection (WHO 2000). Many are asymptomatic carries of the disease. However, malaria typically produces fever, headache, vomiting and other flu like symptoms and if not treated. Parasites become resistant and infections progress rapidly to become life threatening (While and Oliavo 1996). Malaria is developing unacceptable levels of resistance to one drug after another and many insecticides are no longer useful against mosquitoes transmitting the disease (WHO 2009). Malaria being a focal disease differs in its characteristic from country to country and even with the same country. Malaria is unique among diseases because its roots lie so deep within human communities (Heggenhougen et.al, 2003). Malaria beliefs and practice are often related to culture and can influence the effectiveness of control strategies (Adera 2003) thus local knowledge and practice related to malaria are important for implementation of culturally appropriate, sustainable and effective interventions (Vijayakumar et.al., 2009). No single strategy is applicable for all situations and implementing any particular strategy may be problematic in an area. There has to be a regular

assessment of each country's malaria situation. Malaria is a major health problem in Nigeria. Mothers' perceptions, knowledge attitude and management practices about malaria cause from agents, symptom identification, treatment and prevention are often overlooked in control efforts and these vary from individual household. (Rodrigueze, et.al, 2003). This study was aimed to assess the status of malaria infection among school children in Ikot-Ekpene L.G.A and mothers knowledge, attitude and management practices of the disease for effective management and control in order to reduce the high rate of morbidity and immortality in children.

MATERIALS AND METHODS

Study Area: This study was conducted in St. Peter's Primary Schoo Ikot-Iyang and St. Teresa's Catholic school, Ikot Osurua both in Ikot-Ekpene Akwa Ibom state. Ikot Ekpene is a tropical rainforest region. the climate is humid with an average daily maximum and minimum temperature of 29°c and 24°c respectively. It has an average rainfall of about 2400mm and has two seasons; raining and dry season in the year. The rainy season which is between March and October and the dry season is between November and February. Average humidity temperature is 90% and 27% respectively. its land consist of low lying arable and fertile being bathed by local fresh water streams. These together with its humid climate and leaf foliage which trap water as breeding sites for mosquitoes make it vulnerable and conducive to the breeding and transmission for malaria vectors of malaria. The area is densely populated comprising of many communities, Ikot Osurua is located along Aba road in the urban area while Ikot Iyang is located in the rural part of the local Government Area of the state. The inhabitants are mainly farmers, traders, craftsman and civil servants.

Study Population and Data Collection: The study population included 250 pupils selected randomly from two primary schools in Ikot Ekpene Local Government Area Akwo Ibom State. One hundred and fifty pupils from St. Theresa's Primary school Osurua and one hundred from St. Peter's Primary school Ikot Iyang.

Blood sample was got from the pupils between June and August 2015. Sample questionnaires were administered to obtain information on the socio demographic profile of the respondents and then knowledge, attitude and management practices regarding malaria.

Ethical Approval: Permission was obtained from the school authority before commencement of the study. The procedure of the study was properly explained to the subjects' prior blood collection by the health practitioner. Consent of mothers/care givers was sought and received before being included in the study. Questionnaires were also given out to mothers alongside.

Sample Collection and Parasitological Screening: Two milliliters (2ml) venous blood sample was collected from each child using a tourniquet tied to the upper arm of the child using 5ml syringe. Samples were then transferred into fresh EDTA bottles, labeled with code numbers, age, sex and taken immediately to the laboratory for screening and identification of malaria parasites. The screening was done using giemsis in stained thick and thin blood films as recommended by WHO (1991). The films were examined using the 100 x oil immersion objection.

Statistical Analysis: Statistical analysis was done using statistical package for chi-square (X^2) statistical significance tests $P<0.05$.

RESULTS AND DISCUSSION

Out of 250 samples randomly selected and screened, 193 (77.2%) were infected with malaria parasites. Theresa's Primary school pupils Ikot Osurua was more 122 (81.3%) than St. Peter's Primary school pupils Ikot Iyang 71 (17%). (Table 1). The overall prevalence according to sex from both schools showed that females were more 113 (82.9%) infected than males 80 (70.8%). This result is not statistically significant (Table 2). The overall prevalence of malaria infection according to age indicated that malaria was highest (84.6%) among the age group 5-7 years, followed by 2-4 years old (79.4%) then 8-10 years old (76.1%) and the least (66.6%) was among age group 11-13 years old. This result was statistically significant $P<0.05$ (Table 4). In St. Peter's Primary School located in the rural area according to age. The highest (80%) was among age group 8-10 years followed by 2 - 4 years old (79.3%) then 5-7 years old (73.9%) and the least (47.8%) was among 11-13 years old. While in St. Theresa's Primary school located in urban area, the highest (90.7%) was among 5-7 years old, followed by age group 11-13 year (80.6%) then 2-4 years (79.4%) and the least was among 8-10 years old (Table 5). Result of the knowledge, attitude and practices (KAP) of the respondents showed that majority (71.5%) of the respondent reported mosquito bites as the cause of malaria. Some (13.5%) believed that eating too much oil caused malaria, few (9%) and others (6%) said malaria is caused by drinking dirty water and witch craft respectively. (Table 6). Signs and symptoms associated with malaria are believed to be few (44.5%), dizziness (15.5%) nausea (11.5%) and no idea (11%). On knowledge of preventive measures

reveals that majority (39. %) use mosquito coils, other use insecticide treated bed net (31%), insecticide spray (18.5%) and mosquito window nets (11.5%) respectively (Table 6). Treatment and management of malaria among the respondent showed that most (44%) visit the patient medicine store and self-medication, some (12%) visit hospital a few (6%), while a few (12% and 6%) use local herbs and visit traditional healers. On diagnosis practices, majority (48%) relies on observing child manifestation signs and symptoms others use child complements (30%) while others (22%) carry out lab test. (Table 6)

Table 1: Overall Prevalence of Malaria in the Study Areas

Name of Schools	No. Examined	No. Infected	Percentage infected
St. Peter's Primary School Ikot Inyang	100	71	71.00
St. Theresa's Primary School	150	122	81.40
TOTAL	**250**	**193**	**77.20**

df= 1, P<0.05: X^2 cal = 13 – 412 > X^2 tab = 3.84

Table 2: Overall Prevalence of Malaria Infection According To Sex Distribution In The Study Areas

Sex	Number Examined	Number Infected	Percentage Infected	P -Value
Male	113	80	70.81	1.171
Female	137	113	82.90	
TOTAL	**250**	**193**	**77.20**	

df = 1, P<0.05: X^2 cal = 5.618 > X^2 tab = 3.84

Table 3: Prevalence of Malaria Infection According To Sex in the Study Areas

	St. Peter's Primary School		**St. Theresa's Primary School**		
Sex	Number Examined	Number Infected (%)	Number Examined	Number Infected (%)	P - Value
Male	42	30 (71.43)	71	50 (70.42)	6.960
Female	58	45 (77.59)	79	68 (86.07)	6.50
TOTAL	**100**	**71 (71.00)**	**150**	**122 (81.40%)**	

Table 4: Overall Prevalence of Malaria Infection According To Age in the Study Areas

Age	Number Examined	Number Infected	Percentage	P – Value
2 -4	68	54	79.41	
5 – 7	65	55	84.62	4.77
8 – 10	63	48	76.19	
11 – 13	54	36	66.67	
TOTAL	**250**	**193**	**77.2**	

Table 5: Prevalence of Malaria Infection According To Age in the Study Areas

	St. Peter' Primary School		**St. Theresa's Primary School**	
Age	Number Examined	Number Infected (%)	Number Examined	Number Infected (%)
2 -4	29	23 (79.31)	39	31(79.49)
5 – 7	23	17 (73.91)	42	38 (90.71)
8 – 10	25	20 (80.00)	38	28 (73.68)
11 – 13	23	11 (47.83)	31	25 (80.65)
TOTAL	**100**	**71 (71.00)**	**150**	**122 (77.20)**

Malaria is a killer and debilitating disease that affect the physical and economic wellbeing of people living in endemic area of Africa (WHO 2008). The result of this study revealed that 77% of the pupils were infected of malaria parasite. Pupils from St. Teresa's Primary School Osurua was more (81.4%) infected than those of St. Peter's Primary School (71%). This may be due to location of St. Theresa's Primary School which is located in urban area with very poor sanitation that necessitates the breeding of mosquitoes and spread of the parasites. This is in line with observations of Castro *et al*., (2010) as one of the risk factors of malaria burden. More malaria infection are recorded among the female subject than the males. This is in agreement with other works such as those of Oparaocha (2003) and disagreed with Etusim *et al* (2013) and Adekunle *et.al*, (2014) who reported more males to be more infected than the female counterpart. This may be because female are involved more in domestic chores and farm work than their male counterpart. All age groups were affected by the infection although the highest (84.62%) was among age group 5-7 years and the least (66.6%) was among age group 11-13 years. This is similar to report of Ogonna (2004). This also indicated that infection rate of malaria decreases with increase in age. Hence older

children are less susceptible to malaria because some have developed immunity against malaria parasite due to persistent attacks.

Table 6: Responses of the Subjects on Knowledge Attitude and Management Practices on Malaria Infection in the Study Areas (No. 200)

Variables	No. of Response	Percentage
CAUSE		
Mosquito bite	143	71.5
Drinking of dirty water	18	9.0
Witch craft	12	6.0
Eating much oil	27	13.5
TOTAL	**200**	**100**
SYMPTOMS		
Nausea	23	11.5
Vomiting	15	7.5
Fever	89	44.5
Dizziness	31	15.5
Cough	20	10.5
No idea	22	11.0
TOTAL	**200**	**100**
PEPELLANT USED		
Insecticide Spray	62	31.0
Mosquito Coils	78	39.0
Mosquito window net	23	11.5
Insecticide treated bed net	37	18.5
TOTAL	**200**	**100**
DIAGNOSIS		
Carried out Lab Test	44	22.0
Used child complaint	60	30.0
Observing child	96	48.5
Manifested signs	-	-
TOTAL	**200**	**100**
TREATMENT		
Used of Local herbs	24	12.0
Visit traditional healer	12	6.0
Visit hospital	76	38.0
Go to patient medicine store	88	44.0
TOTAL	**200**	**100**

Mothers/caregivers response on knowledge about malaria causative agents revealed that majority of the respondents attributed the cause of malaria to mosquito bites. This agrees with the workers of others such as Ezeigbo (2015), Baird (2006), Amadi and Nwankwo (2012) where respondents identified mosquitoes as the vector of malaria. How some (13.5%) response agreed that malaria is caused by oily food while few (6%) respondents still believe that malaria is caused by witchcraft. This may be attributed to ignorance, level of education and traditional believes and such misconceptions should be corrected so as to avert the negative influence of such misgivings. Most common signs and symptoms associated with malaria as observed in this study revealed that majority (44.5%) reported fever others reported dizziness, nausea, cough, vomiting. This agrees with work of Ajumobi (2012) as common signs of malaria. On the efforts to prevent malaria, most of the mosquito coils, some use insecticide spray other

use insecticide treated bed nets and mosquito window nets respectively. This agrees with work of Amadi *et al*., (2017). Method of malaria diagnosis carried out by mother/caregivers showed that majority adopted observing child's manifested signs some reported the use of child's complaints while few carried out laboratory tests. This could be life threatening as some other diseases share similar symptoms with malaria. Furthermore, the child may not be able to give accurate description of how they feel and this could result to administration of wrong drugs. Majority visited patent medicine stores for malaria treatment while others visited hospital, use local herbs and visit traditional healers. These methods of treatment could lead to drug resistant and improper treatment of malaria which can eventually lead to high morbidity and mortality especially in children. This study showed that malaria is still a major health issue in the study area. Although awareness of the disease is high the attitude towards prevention and management practices especially among mothers/caregivers is still low and very worrisome and could result in high morbidity and mortality especially among children. This calls for great concern and intervention. Malaria prevention and control efforts should aim at creating local examples of excellence to promote good practices towards malaria prevention campaign for mother/caregivers and create awareness on prevention, proper management practices and treatment of the disease that may lead to reduction of vector of malaria infection and control of the disease, especially in younger vulnerable children by relevant stakeholders. Free or subsidized insecticide treated bed nets (ITNS) should be made available to mothers/caregivers so that the infection of malaria could be controlled.

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