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Occurrence of malaria infection in under-five children in Orlu, L.G.A. of Imo state, Nigeria

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Abstract

This study was carried out between March 2014 and June 2014 on the occurrence of malaria infection in under five children in Orlu Local Government area of Imo State Nigeria. The study covered 381 randomly selected households and 622 consenting subjects with information's gotten mostly from mothers and nannies as care providers. The study population was 510 children below 5 years of age. Analysis of data collected shows that 77% of respondents in the rural area had no education above secondary school level, while 56% of respondents in the sub-urban area had education up to secondary school and 67% of respondents in the urban area had education up to the secondary school level this incidence of malaria in the studied areas in inversely proportional to the socio-economic levels of the areas in under study Incidence increased with decrease in socio-economic levels and the improvement in living standard. Use of bed nets is more common in communities with better socio economic status. Regarding management of Malaria ie purchase of across- the counter drugs use of leftover drugs, application of traditional medication etc. was highest in Amike and decrease to the lowest in the urban local Government headquarters. Also malaria related complications were more among the children from low socio-economic households than their counterparts of high socio-economic level.

Keywords: malaria infection, Imo State Nigeria, socio-economic levels.

Introduction

Globally malaria is increasingly becoming a disease of serious concern to everybody. This is because day by, the impact of malaria on human existence the world over becomes more ravaging and damaging parts of the globe especially the developing countries of which Nigeria is one. The over bearing impact of malaria infestation in the tropical region and developing

countries can be accounted for by changing factors like high breeding rate of vector and high transmission rate of parasite round the year which peaks during the raining season, increased number of sites conducive for mosquito breeding accessioned by incessant rains, ignorance, poverty, unsanitary environment conditions, poor behavioral attitude, inadequately

planned socio-economic projects (Oparaoha, 2003; Obeagu *et al.*,2017;Obeagu *et al.*,2014; Obeagu *et al.*,2014; Obeagu *et al.*,2017; Nwosu *et al.*,2015; Obeagu *et al.*,2013; Nwosu *et al.*,2016; Nwosu *et al.*,2015;).

Because of this costly impact of malaria of human and material resources, emphasis has shifted from curative to control measures, especially as evidenced by the activities of World Health Organization (WHO 2000) in its Roll Back Malaria Program. This shift of emphasis is informed by the fact the treatment of malaria since its discovery has not very effective and reliable due to drug resistance, high cost of anti-malaria drugs, non-available or poor accessibility to anti-malaria drugs by the underdeveloped parts of the works.

Also superstition, ignorance and poverty have some reasonable percentage some reasonable percentage contribution to the problems in the fight against malaria.

1.2 Aims and objectives

This study is aimed at achieving the following objectives.

1. To bring to the fore the incidence and management of malaria in Imo State as relates to urban, sub-urban and rural localities in the state.
2. To study comparatively the incidence and prevalence of malaria indifferent communities among under five children in Orlu Local Government Area of Imo State.
3. To study comparatively the general malaria preventive measures example use of bednet among the three selected communities with a view towards establishing differences.
4. To examine the prevalence and impact of across-the-counter purchase and consumptions of anti-malaria as the major home management strategy for malaria in the three areas under study.

Materials and Methods

Study area

The study was done in Orlu Local Government Area of Imo State Nigeria Okporo has been chosen based on socioeconomic consideration in ascending order of socioeconomic and infrastructural development.

The five communities are all traversed by major government roads.

Sampled population

Among the communities three areas were sampled in the research on occurrence of malaria infection in under five children in one rural, one suburban and one urban area of orlu local government area of imo state, which held within then period of Jan. 14 to June 23, 2014.

The communities are Umuna, Amaifeke and Amike. Amike represent a poorly rural population, it comprises mostly subsistence farmer cultivating cocoyams and cassava largely. The only symbol of development here are two primary schools with dilapidated building and one non-functional government owned health center. There is no nursery primary school. There is only one patent medicine store which is poorly stocked with drugs and named by only a primary six certificate holder with no formal medical training at all. The households student were only those who consented after the meaning of the exercise to be carried out was explained to them. Amaifeke is a fairly developed area One nursing primary, 3 public primary schools, 2 secondary schools several small scale Industries, a weekly functional government owned health penter, two functional private hospitals, three maternity Lomes,7 patent medicine shops and 2 moderately equipped medical laboratories managed by trained medical laboratory scientists. The population is mostly subsistence farmers and road side trade.

Orlu Headquarters is a urbanized community hostingmostly public servants, road side traders, artisans and •subsistence farmers. There is electricity, 2 kindergarten,5 primary schools 3 secondary schools, several small and medium scale industries, a functional mission owned hospital with a school of nursing, 3 functional private hospital, 2 maternity homes, 15 patent medicine shops, 4 moderately equipped medical laboratories managed by trained laboratory scientists.

3.3 Methodology and data collection

The principal tool in the conducting of this research is the questionnaire. No blood samples were taken as the presence of three or more classical symptoms of malaria in children. These symptoms, includes headache, moderate to high grade fever, vomiting, loss of appetite, weakness, anemia and jaundice. Also

splenic enlargement which is commonly observable by the mothers or care providers is also a diagnostic sign. This method was applied because of Non-acceptance of parents or care providers of the studied children of the withdrawal of blood from their children. To compensate for this, the care providers volunteered information freely to research conductors.

Before the exercise proper. The parents were thoroughly educated as a group on two or more accessions on the classical symptoms and signs of malaria in under 5 children (see above). Also a pilot survey merged with advocacy visits was conducted on few houses as a test-run. These were much cooperated from the too invasive.

3.4 Final experiment survey

A non-rigid mapping process was applied to facilitate then study. The three study communities were each mapped into four sections. Each section comprised at least 15 households each of which must contain an under five child. Random selection and willingness to volunteer information were employed in selecting the first house to start within each section. Each block of 15 households was assigned to interviewers. The children were given tellers bearing their numbers and name and age which their care providers were asked to presents. A two time's weekly visits was paid to each block of household by their assigned interviewers for the number of weeks involved in the study. In each visit, health condition of the children with tellers for the past week was inquired about regarding ailment suffered, severity mode of treatment and reason for the mode of treatment. Also sleeping beds for children were inspected and noted for bednets with presence or absence of bednet noted (Hamel *et al.*, 2004) the social status, educational levels and means of livelihood of the care providers were noted on the first day of visit to each household.

The information volunteers were left at their natural state to speak without any suggestions or leading from the interviewers. Throughout the interview periods, each pair of (interviewers were accompanied by at least one respectable elder from the village who first of all oriented the respondents on the implication of the research before interviewing commenced.

To confirm splenic enlargement, fever, anemia and jaundice, the interviewers were allowed to examine the children physically and for the sake of cooperation were "pretentiously" called "doctors". Study children found to be too sick were referred to hospital

for treatment after information on them were collected.

Five children, could not see the end of the research period. One died from each of the communities while two, one from Amike and one from Ameifeke relocated with their care providers before the end of the research.

Results

A survey carried out between inarch 2014 and June 2014 occurrence of malaria infection among "under 5" children in one rural, on suburban and one urban of Orlu Local Government Area of Imo State, has the following results.

A total 313 household was visited during the period with 622 consenting care providers interview. However, not all care providers interviewed had a child studied. The Care providers were, mostly mothers or nannies with few being fathers.

There were a total of 6400 child contacts within the study period. In which 1121 (1.0%) of such child contacts, a child was found to be ill with symptoms of malaria as at the time of contact or a week before contact. Also 77% of care providers in the rural area had no education above secondary school level and 67% of care providers in urban area had education up to secondary school level.

The following subheadings will make the analysis of the results clearer.

4.1 Education and social status of the care providers of studied children

The educational status of the care providers in Umuna was far higher than that of Amaifeke and Amike. In Umuna, only 6(6.1%) out of 99 care providers investigated were illiterates, while for Amike on the other hand 27 (<24.6%) of the 110 care providers investigated have no formal education at all. Amaifeke lies in the middle of the Spectrum.

The Umuna hosts 47(47.3%) of the care providers studied who have education above primary school while Amaifeke has 50 (48.1 %) in the same group. For the purpose of this work, secondary education includes education concluded in a Secondary Commercial and Secondary Technical Schools.

Umuna has 19 (19.3%) of its studied care providers with secondary school while Amaifeke has 9 (7.7%) and Amike has 5 (4.5%) of this category.

Also both the mean annual income level and range of annual income falls with increase in rurality of the study areas. Whereas mean annual income of #250,000-#500,000. two hundred and fifty thousand naira only-five hundred thousand naira only, that of Arnaifeke, a suburban area is #71,500 (seventy-one thousand five hundred naira only and annual income range of #500,000-#700,000 (fifty thousand naira only to seventy thousand naira only) and that of Amike is #39,500; = (thirty nine thousand five hundred naira only with an annual income range of #25,000-#45,000:= (twenty five thousand naira only-forty five thousand naira only). A cursory look at the mean annual incomes show that for Amaifeke a suburban and that for Amaifeke also nearly double that for Amike. These discrepancies, surely will affect the affordability of standard antimalarial preventive and curative measures in the different study areas.

4.2 Occupation of household heads of studied of children

A total of 318 household heads were interviewed in the study regarding their *occupational Status*. In some cases of the household head was also the care provider and in others he or she had no hand in care providing. For the 100 household heads interviewed in the Umuna 41 (41%) had a stable monthly income base by being either civil servant or public servant, who are either skilled or sem-skilled workers. The remaining (61%) were unskilled self employed artisans and craftsmen whose monthly income. Base on unsteady and difficulty to quality because of the non-regularity of patronage of their service or wares. This is so because of the location of the Umuna in this region, which has attracted establishments like banks, secondary schools private and government owned medical Institutions, law chambers and insurance companies.

For Amaifeke, located along a fairly busy interstate road, having no significant government presence 10 (9.0%) of the 111 household heads only can boast of regular monthly income either as civil servant or self employed professionals. The remaining 101 are very wretched prtisans and heads whose monthly income apart being unsteady; merely suffice for their unbalanced daily feeding.

Amike, a rural community though traversed by a non-busy government road, has only 3 (2.8%) of the household heads with stable monthly income.

This is no skilled person among them. The rest are artisans, laborers and unemployed who merely depend on living a daily through their occupation.

4.3 Age and sex analysis of studied children

The age and sex data of the studied children for the Lhree study areas reflect very negligible difference among the areas, the mean ages (yrs) of 1.85 for Umuna, 2.63 for those who had 6 or more attack in the period of study, 16 (9.1%) of 173 studied children-in Amaifeke fell into this group.

For those who had between 1-5 attack during theperiod of study, there is no significant difference in percentage as show as follows:-,

- (a) Umuna = 71.8%
- (b) Amaifeke - 76.9%
- (c) Amike 80.7%

Incidence figures for the three study areas are

- (a) Umuna-2.03%
- (b) Amaifeke = 2.05%
- (c) Amike =2.08%. Generally there is no significant difference in the incidence values for the three study area, inspite of difference in social status and economic power.

4.5Complication of malaria with regards to studied children in each of the study areas (Table 5)

An overview of this result a striking discrepancy among the three study areas. While the Umuna urban areas has 65 (65.7%) studied children with no complications in their malaria attacks the percentage decreased towards the rural areas with Amaifeke a suburban having 58 (55.5%), Amike 45 (43.3%) as a purely rural area. On the contrary, the percentage of children with complications during or after malaria attacks increased arithmetically in the direction of Amike, from the Umuna. Amike has 58 (51.8%) of its studied children with complications and 8 (7.3%) death, while Amaifeke has 41 (38.4%) with complications, and 5(4.8%) death. Umuna which is an Urban area has leastcomplications among the studied children with only 32(35.3%) of the studied children having complications of malaria and only 2 (2.0%) death in the course of the research.

Also the same trend of increased rate from Urban towards rural study areas is observable when the complications are considered either individual on the table. Taking for instance, children is one of the commonest complication of malaria in under five children, the values of 13 (13.1%), 19 (18.3%) and 26 (23.6%) for Umuna, Amaifeke and Amike

respectively shows almost a tie between Umuna and Amaifeke and a wide gap between each of two areas and Amike. The value of 26 (23.6%) for Amike as an entity nearly equal that for Umuna and Amike which is 8 almost equals to that for two communities put together which is 7 (2+5).

Table 1: Age and sex consideration of the studied children (NO AND %)

	UMUNA	AMAIFEKE	AMIKE
Age range of studied children (years)	0.50-5:1	0.50-5.00	0.4-5.02
Mean age of children studied	1.85	2.63	2.32
No (%) of female children studied	44(44.4)	59(56.7)	47(42.7)
	55(55.6)	45(43.3)	63(57.3)

Table 2: Incidence of malaria among the studied children in each of the three study areas.

No of attacks	Umuna	Amaifeke	A Mik	total
	A		E	
0	39	24	12	75
1	50	54	53	157
2	38	40	42	120
3	20	22	23	65
4	6	7	7	20
5	9	10	8	27
6	6	8	8	22
7	2	3	4	9
8	4	4	4	12
9	2	1	0	3
10 and above	0	0	0	0

NB for the 4 months study period, incidence of malaria among the studied children in each of the three

study areas are 2.03, 2.05 and 2.08 episodes of malaria for Umuna Amaifeke and Amike respectively.

kid treatment				
consulted a nearby maternity without a doctor	15(11.1 %)	27(12.9%)	39(14.2 %)	81(21.8%)
visited a formal hospital with a doctor	21(15.6 %)	13(6.2%)	9(2.3%)	43(5.5%)
called a man of pd for prayers	3(2.2%)	7(3.3%)	13(4.7%)	23(7.3%)
applied traditional medications	2(1.5%)	5(2.4%)	7(2.6%)	14(2.2%)
visited healing homes /prayer houses	2(1.5%)	3(1.4%)	4(1.5%)	8(1.4%)
Went to a pharmacist	1(0.7%)	2.1.0%)	0(0.0%)	3(0.5%)

Table 3: Severity considerations with reference to malaria complications in studied children in each of the study areas.

	UMUNA	AMAIFEKE	AMIKE	TOTAL
No complication	65 (65.7%)	58 (55.8%)	45 (43.3%)	168 (53.7%)
Anaemia only	8 (8.1%)	12 (11.5%)	13 (11.8%)	33 (10.5%)
Convulsion only	13 (13.1%)	19 (18.3%)	26 (23.6%)	58 (18.3%)
Jaundice only	11 (11.1%)	10 (9.6%)	18 (16.4%)	39 (12.5%)
Anaemia and convulsion	5 (5.1%)	7 (6.7%)	10 (9.1%)	22 (6.0%)
Anaemia and jaundice	4 (4.0%)	5 (4.8%)	7 (6.4%)	16 (6.0%)
Convulsion and jaundice	4 (4.0%)	8 (7.7%)	8 (7.3%)	20 (6.4%)
All three Present	3 (3.0%)	4 (3.4%)	7 (6.4%)	14 (4.5%)
Death	2 (2.0%)	5 (4.8%)	8 (7.3%)	15 (4.8%)

Table 4 treatment strategies for malaria by the careproviders of the studied children

Strategy by care Provider	No and (%) of Strategies			Total
	UMUNA	AMAIFEKE	AMIKE	TOTAL
Resigned to fate	3(2.2%)	6(2.9%)	11(4.0%)	20(2.2%)
Bought unprescribed drugs	55(40.7%)	62(29.5%)	85(30.9%)	117(2.2%)
applied left over medication	21(15.6%)	34(16.2%)	62(22.5%)	117(18.5%)
Went to the medical laboratory/Scientist for diagnosis	12(8.8%)	51(24.3%)	62(22.5%)	117(18.5%)

Table 5: Overview description of use of bednets by the different education levels of care-providers

	UMUNA	AMAIFEKE	AMIKE	TOTAL
to of care providers	99	104	110	313
Education level and No of careproviders that use bednet				
No (%)				
No with formal Education	2(2.1)	1(1.0)	0(0)	3(0.9)
primary school education	5(5.1)	2(1.9)	0(0)	7(2.4)
Secondary school	10(10.1)	5(4.8)	2(1.8)	17(5.4)
College of Education	4(4.0)	2(1.9)	1(0.9)	7(2.4)
Polytechnique	2(2.1)	2(1.9)	1(0.9)	5(1.6)
University	5(5.1)	2(1.9)	2(1.8)	9(2.9)

Use of ITNS was low during the survey generally for Umuna 5(4.9%) and Amaifeke 2(1.9%) of careproviders using ITNS for their under 5 children. Amike had had no careproviders using ITNS for his or her under 5 child/children but has (45,4%) using ordinary bednets. For the general population under study this gives a value of 7(3.5%).

Discussion

From the foregone study, it has been shown that prompt and adequate case management of malaria is the key to control of this disease (Pore man and Campbell 2005). This is in line with the spirit and goals of the roll back malaria programme of and UNDP currently in execution. But in sub-Saharan African, this goal is poorly achieved as residents rely mostly on If medication as an important step in the management of malaria because of lack access to good health care facilities(AgysporManderson, 2003, Ruebush *et al.*, 2006) in any countries in Africa, including Nigeria, 60% of patient Offering from clinical malaria receive their first treatment in non-formal health sector like private health care providers rather than from the formal public health care facilities (Anosike *et al.*, 2005). In Nigeria these formal health careproviders includes patent medical stores, market place, rug hawkers, traditional and spiritual healing homes and veryintegrally the pharmacies. Often the information or private sectors do not make any attempt at connect diagnosis any illness presented by their clients. Their sole contentment is the sale of tables in the affordable dosages or quantities to clients as many be dictated by themselves or the patients. The treatment of malaria and other ailments through this system creates much worry because of the problem of adequate dosing and duration of treatment. The patient just purchase as little or as much of a particular drug according to their resource and ideas on self medication (Ukaga *et al.*, 2005). For Nigeria, this practice may continue for a long time in future because of the week health care services regulatory policies in the country. Formal health sector patronage for children with any form of fever range from 18% at Bungoma District of Kenya (Ruebush 1995) to 75% in Swaziland. Home treatment figures include 28% in Zaire (Vernon, 1993) to 77.6% in southern Ghana (Dungo *et al* and 83% in Togo (Dermining ,2003) difference other figures have been published by workers in Kenya (Harel *et al* and Conakry Guinea Dabis 2007).

In Orlu, for the three areas studies in this project, figures obtained tend to comply with those of earlier workers. For examples in the above study, formal health sector patronage was found to be 15.6% for Umuna 6.2% for Ainaike, and 2,3% Amike with a value of 5.8% for the three study areas put together.

These are very low and discouraging figures. Factors that have en blamed for this observation include poor access to formal health facility and poor socio-economic status of the residents, However, present result shows that which every step is taken care provides in heading the V problems of their wardsrural community, compared with Umuna and Amaifeke which pre urban and Semi-urban respectively the explanation for this not farfetched. Apart from low income status of the Amike people, which makes attendance to hospital and clinics rather late or not at all in the course of malaria attack, nature of occupation of the people has vital role to play. Most care Providers or household heads in Amike, engage in occupations feat keep them away from these children is very poor because enough time is not devoted to it. Hence, malaria and other ailments are discovered more at the stage of complications. us is the opposite of Umuna where most resident have time regulated occupations where enough time is available to look into the health and nutrition of those children by the household heads and care providers. This makes it easier to over ailments at their primary stage and treat them. Also their enhanced economic status is another health promoting factor. However, health education and health enlightenment campaigns will go a long way towards reorienting these people for making them know the important *of attending the formal* health sector as a first-line action in the management of malaria in under 5 children.

With emphasis shifting presently from care to prevention id control in malaria management as exemplified in the RBM depending strongly on the socio-economic status of the care provider and his / her educational status. Another striking nature of this result is the alarming figures seen with regards care providers who buy unperceived (across the counter) education or who use leftover medications for treating their wards. The two tendencies put together, gives the following values for the three study areas 46.3% for Umuna, 45.7% for aifeke and 53.5% for Amaifeke. This tendency to provide home treatment as a first step has been documented in Kenya Reubush 2005, Hamel *et al* 2010) and in Togo (Deming,2011).These figures are outrageous with the most possible outcome bring enhancement of drug resistance. Another important ding the result of this

research is the fact that through incidence of malaria is almost the same for Umuna, Amaifeke, and Amike, treatment pattern differs among the study of the household heads and care providers of the studied children. For example compared with Umuna, the use of left over drugs and tendency to patronize non-formal medical sector indicates the affordability of formal sector medical services was a deciding factor in the effects of care providers to seek health care for their wards.

Also worthy of note is the fact that malaria related complications for example anemia, jaundice, spleen enlargement and even death was highest with Amike. A poorly initiated use of bed nets, especially ITNS, is a veritable tool for every household to possess in this anti-malaria fight.

The use of bednets substantially reduces childhood mortality in malaria. This has been highlighted by researchers in Ghana (Binka, 2006) and Kenya (Nevill, 2006).

In this research work where as 75% of the care providers proved ignorant of what ITNS are, 89% indicated that they know about bednets only as a mode of mosquito bite prevention; especially in their secondary school days. However, the compliance rate for user of ITNS by each of the three study areas was very low with 5.1% for Umuna, 2.9% for Amaifeke and ITN used for Amike. Analysis of table 5 shows that out of 15 care providers of different educational level studied, 48 (2.0%) are bednet compliant. 16 (3%) are ITN compliant. There is no doubt that these are low and are attributable to both the low socio-economic and educational level of the study care providers. Use of either type of bednet is higher with Umuna where care providers have more stable and better income sources and higher educational status. This is because of the metropolitan nature of the study area which is made up of civil servants and public servants who must have a reasonable level of education before employment. Hence the importance of bednets as an instrument of mosquito bites vis-a-vis malaria prevention will be much more easily understood by these people and their income levels will make it affordable to them.

This cannot be compared with Amike, a poorly rural area with poor educational and socio-economic attainment. The use of bednet to them is like expending in futility since most of them do not even believe that malaria is gotten through mosquito bite. Amaifeke a sub-urban area is in the middle of the spectrum. It is necessary that if the fight against

malaria is to yield any positive result, the federal and state governments should set up its anti-malaria campaign efforts. The roll back malaria programme should increase the tempo of its enlightenment programmes and extend it into the hinterlands. Important use of ITNS or ordinary bednets and the need for prompt treatment of malaria in formal medical sectors by care providers should be emphasized in such campaigns. The churches, schools and villages meeting can be veritable tools in the spread of such ideals.

Also health department and ministries should make the ITNS available and affordable and its pretreatment easier so as to attract the compliance of a greater number of care providers. This can be done by subsidizing the prices for initial purchase and pretreatment can be trained by government for the purpose of going the standing therapy.

This will help reduce malaria associated complications. The creation of more job opportunities for rural dwellers especially those within child bearing and rearing age will in no small measure boost the socio-economic status of these care providers, hence enabling them to undertake meaningful preventive and therapeutic measures against malaria whenever it strikes on any of their children, rather than support to self medication and spiritual management which only finally ends up complicating the malaria attract.

Conclusion

In conclusion, this study has in no small measure reassured *improved* the scarcity of data on malaria studies as it relates to Orlu Local Government Area of Imo State. There is no doubt that the incidence data for malaria in Orlu is close to the value for other localities within the same malaria endemic region of Nigeria. Also the management modus does not differ from what obtains in other communities previously studied by other workers on malaria. The low rate of preventive efforts and the appropriate measures by the care providers is adequately highlighted in the table and action is needed by the care providers is adequately highlighted in the table and action is needed by future researches in these areas to unravel the more and overt causes of these inadequacies. This study is a very good tool to anybody intending to do more work on malaria in Orlu in particular and Imo State in general.

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