HUMAN MALARIA INCIDENCE RATE VERSUS VECTOR CONTROL: PERCEPTION AMONG IJEBU-NORTH LOCAL GOVERNMENT INHABITANTS

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Abstract: A Community-based cross-sectional study was conducted in Ijebu North Local Government Area (LGA) of Ogun State, Nigeria to assess the level of community awareness towards malaria vector and its control. This study was conducted from the month of March to July, 2017. 500 copies of well-structured questionnaires were distributed within 6 randomly picked Health Facilities covering 4 major towns. Out of 472 questionnaires returned, male respondents (54.9%) were more than female (45.1%), respondents were mostly within the age range 41 year and above (4.1%), with elementary education (46.4%), married (52.7%) and into private businesses (26.1%) being most in each case. All respondents (100%) affirmed their knowledge on the prevalence of malaria; only 22% suggested that malaria is caused by *Anopheles* mosquito. On vector control, most respondents employ the use of insecticides (50.6%). Those that have LLIN were 86% of the sampled population but 66% of this group does not use the net. Knowledge gaps about cause and transmission of malaria was observed. The stepping up of awareness programmes by the Local Government Authority and NGOs as well as the provision of power is recommended.

Keywords: Ijebu-North LGA, health facility, malaria, vector control, LLIN, insecticides

Introduction

Malaria is the world's most prevalent vector borne disease caused by infection with a protozoan parasite of the genus *Plasmodium* (WHO, 2010). World Health Organization, 2010 estimates are that there are 300-500 million cases of clinical malaria per year, with 1.4-2.6 million deaths, many among African children. Malaria is a major cause of infant mortality and is the only insect borne parasite disease comparable in impact to the World's major killer transmissible diseases: diarrhea, acute respiratory infections, tuberculosis and AIDS (Curtis, 2003). The disease is transmitted through bites from infected female mosquitoes of the genus *Anopheles* (WHO, 2010). Knowledge of the geographical distribution of the different species, their ecological parameters, role in transmission, and susceptibility to insecticide-based interventions is needed if malaria is to be controlled and eliminated in the next decade (Obembe *et al*., 2018).

In Nigeria, up to 60% of outpatient attendance in health facilities is due to malaria and 30% of all hospital admissions (FMoH, 2005; 2009). It is estimated that malaria is responsible for nearly 110 million clinical cases and an estimated 300,000 deaths per year. The economic burden of this disease in Nigeria is estimated to be N132 billion lost annually in terms of treatment costs, prevention and loss of man hours (FMoH, 2005; 2009). Most malaria deaths occur at home hence is not reported (Rugemalila *et al.*, 2006). The disease can be attributed almost entirely to the mosquitoes *Anopheles gambiae*, *An. arabiensis* and *An. funestus*, three of the most efficient malaria vectors in the world. All live almost exclusively in close association with humans and feed on blood, primarily from humans (Besansky *et al.*, 1994). Malaria is estimated to slow economic growth in African countries by about 1.3% per year. Malaria constitutes a major economic burden on endemic communities in Africa including Nigeria. The disease thus constitutes a great burden on the already depressed Nigerian economy.

Despite the fact that strong attempts to eradicate malaria have been made, the disease burden is still on the rise and some estimated that the number of cases could double in the next twenty years without the development of new methods of control (Sachs and Malaney, 2002). Aside from the human tragedy, this predicts an economic disaster which is likely for the stricken countries (Cahill, 2004). The World Health Organization recommends the implementation of vector control to curtail the spread of malaria where the parasite is resistant to antimalarial drugs. Vector control remains the most effective measure to prevent malaria transmission. It is also one of the four technical elements of the global malaria control strategy (WHO, 2006). Unfortunately, as at the time of this study no community based effort was operational to control *Anopheles* vectors in the study area nor is there adequate information on the malaria vectors of this part of Nigeria.

Vector control is a major component of the national campaign against malaria in Nigeria. The global strategic plan for Roll Back Malaria recommends that by 2010, 80% of the population at risk need to be protected using effective vector control measures. To achieve this objective, there is a need to scale up all effective components of Integrated Vector Management (IVM) which include Long Lasting Insecticidal Net (LLIN) and Indoor Residual Spraying (IRS) and larval source management (FMoH, 2009). In spite of the evidence that vector control is crucially important in reducing malaria morbidity and mortality, Inadequate knowledge and misconceptions about the transmission, as well as, the management of malaria and malaria vector, have been reported among various strata of the society especially inhabitants of rural settlements, with the notion that these category of people have little or no idea about this subject matter, which thus affect their malaria control measures, probably because of variation exposition (Iwueze *et al*., 2013). Hence, community based cross-sectional study was conducted in Ijebu North Local government; to assess the level of community awareness towards malaria vector and its control method among residents.

Materials and Methods

Study area

The study was carried-out within selected communities of Ijebu North Local Government Area. Inhabitants of communities in this area have maintained increased records of malaria related complications over the years (Local Government Health Unit, 2011). Ijebu North is a Local Government Area in Ogun State, Nigeria. The local government was established in 1979 and has its headquarters at Ijebu Igbo. It has an area of 967 km² and a population of

284,336 at the 2006 census. It is bounded by Oluyole Local Government of Oyo State in the north, in the west by Ijebu East Local Government, in the South by Ijebu North East, Odogbolu and Ijebu Ode Local Government, and in the east by Ikenne Local Government. This region is peopled by the Ijebus, who live in the following major towns: Ijebu Igbo, Ago-Iwoye, Oru, Awa, Ilaporu, etc.

Data collection

A community-based cross-sectional study was conducted in Ijebu North Local Government Area. Well-structured questionnaire were administered to 500 respondents out of which 472 were returned. The questionnaires comprised of open-ended and closed-ended questions as administered to participants from each of the Six (6) communities. Only participants above 18 years were included in the study. Six (6) communities (Health Facilities) were made use of in this research work (Ago-Iwoye; Oke-Igan - N $6^0$26'39'' E $3^0$25'22'' and Ibipe - N $6^0$56'25'' E $3^0$55'13'', Oru-Ijebu - N$6^0$93'39.2374", E4^{0}12'41.4319'', Awa-Ijebu - N6^o57'46.398", E3^{o}56'13.614" and Ijebu-Igbo; Ojowo - N$6^0$58'54.o444", E3^{0}59'21.2604''and Oke-Agbo - N$6^0$57'34.9128", E4^{0}04'45.3816").

Data analysis

Data collected (responses from the completed questionnaires) were coded and subjected to analysis. The questionnaire items (respondent's socioeconomic characteristics and some selected research questions that were based on the research objectives) were analyzed using descriptive statistics, presented in tables, figure and chart using frequency distribution and percentages using SPSS software version 20.

Results and Discussion

Socioeconomic characteristics of respondents

Figure 1 showed the sex of respondents, males were 54.9% while females were 45.1%. On age range, 41 and above were most (44.1%), house owners were within 18 – 25 years of age having 9.5% (Fig. 2). Educationally, respondents were mostly having Primary School Leaving Certificates (46.4%) (Fig. 3). In terms of marital status as shown in Fig. 4, 52.7% were married while the divorcees were the least (1.1%). On their occupational status, most of the respondents were Private business owners (26.1%) followed by Government employees (24.8%), while farmers (8.3%) were least in population (Fig. 5).

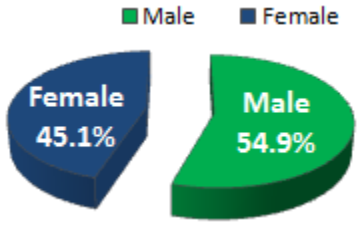

Fig. 1: Respondents' sex distribution

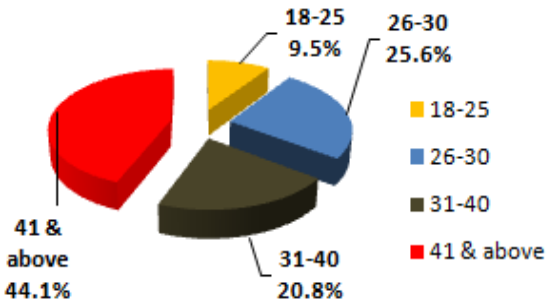

Fig. 2: Age distribution of respondents

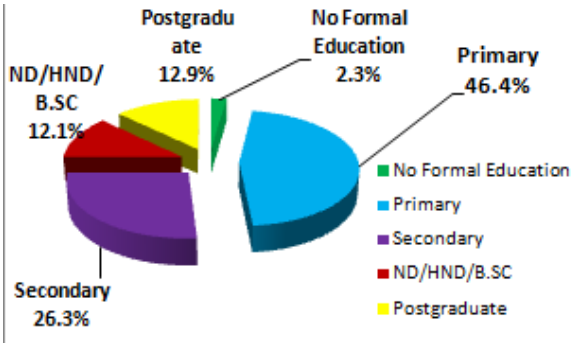

Fig. 3: Respondents' educational status

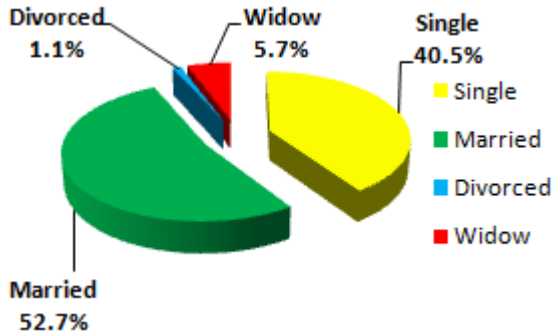

Fig. 4: Respondents' marital status

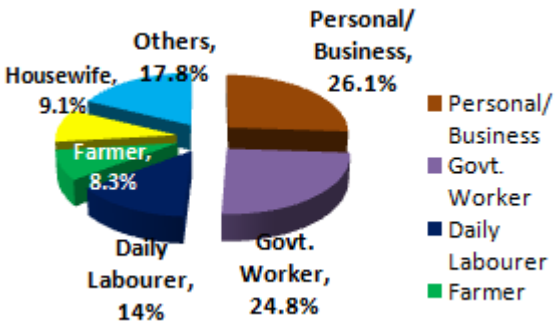

Fig. 5: Occupational status

Assessing the socioeconomic status of the respondents, males (54.9%) were found to be more due to their positions as heads in most apartments visited. Most of the apartments surveyed were owned/headed by adults of 41 and above ages (44.1%) and who are married (52.7%). Educationally, most respondents are found to be Primary School attendee or Certificate holders which pointed to the fact that most household heads are either into business or farmers and this fall in line with the finding of Singh *et al.* (2014) who worked on knowledge and practice on malaria among the people of Aliero, Northern Nigeria.

Perception and awareness on malaria vector control

All the respondents (100%) affirmed that the disease, malaria is real (Table 1). The vector of malaria was mostly opined to be mosquito (74.6%), through stress was 18.6% and Intense Sun (6.9%) (Fig. 6). Malaria assessment and its prevalence in the study area proofs that all the participants (100%) are aware of malaria as a disease, the mode of transmission was reported to be via mosquito by 74.6% of the respondents. Although other respondent believed that the disease is caused by agents other than mosquitoes. This was also reported in the work of Singh *et al*. (2014) where 74.3% opined that malaria is transmitted by mosquitoes.

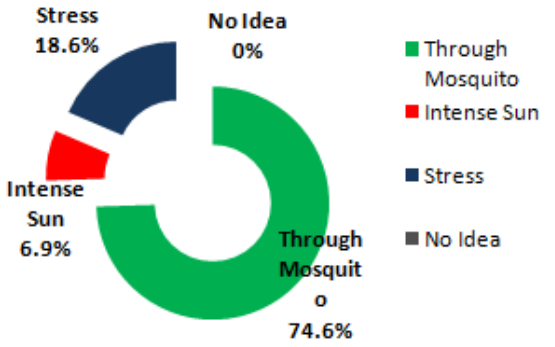

Fig. 6: Respondent idea on means of malarial transmission

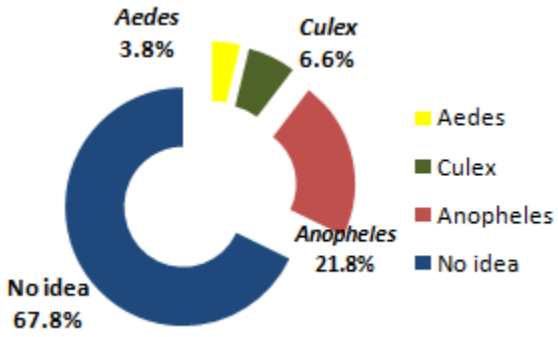

Fig. 7: Responses on malarial vector mosquito

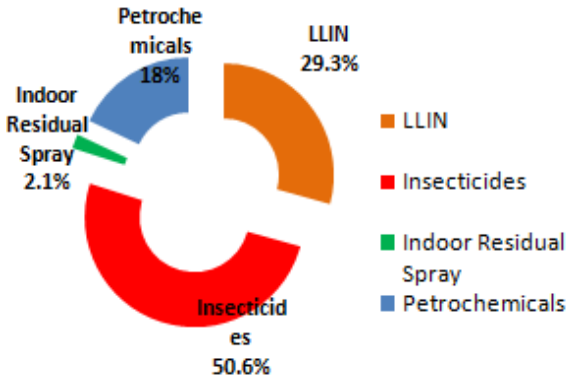

Fig. 8: Responses on vector control methods used

Figure 7 reveals the perception of Ijebu North Local Government Area people on the vector of malaria; 68% had no idea, 22% opted for *Anopheles* while the least suggested was *Aedes* (3.8%). In Fig. 8, they also responded that for the control methods used; usage of insecticide (50.6%) is more profound followed by the use of impregnated nets (29.3%) while indoor residual sprays had the lowest percentage use of 2.1%. Those who are aware of Long-lasting Insecticidal Nets (LLIN) were 86% of the population but most of them do not use the nets in their apartments (66%) (Table 1). And in a verbal communication with the respondents, virtually all those who do not use the LLIN at home stated that the reason is because of heat as a result of power outage.

Table 1: Responses on awareness and perception of respondents on malaria vector

Question	Option	Frequency	Percentage
Awareness on malaria	Yes	472	100
	No	-	-
	No Idea	-	-
Awareness of LLIN	Yes	406	86
	No	66	14
	No Idea	-	-
Usage of LLIN	Yes	138	34
	No	268	66
	No Idea	-	-

Insecticide use (50.6%) was reported to be the most employed method of controlling the mosquitoes in the Local Government Area which fall in line with the study of Adedotun *et al*. (2010) who worked on selected urban communities in Oyo State and the similarity could be due to the features Oyo shares with Ogun state by being located in the rainforest part of the country. 86% of the respondents were aware but the usage were minimal (34%) which is similar to a study in another endemic rural settlement in Ethiopia where 92.4% are aware of the insecticide treated nets (ITNs) but the usage were also minimal (57.8%). This was due to the cost of purchase and poverty rate. The reason for the low usage in Ijebu North was rather due to heat experienced when hung as a result of epileptic power supply in the Nigeria.

Conclusion

The study reveals that the respondents have little knowledge about the cause of malaria. The residents of Ijebu North Local Government are aware of the vector as well as the abundance of malaria parasites which causes malaria supported by the pastoral environment. People's knowledge of malaria vector control was a bit low but participation level was relatively lowers than their knowledge and awareness. It is evident that the people of Ijebu North local government area overall awareness about the symptoms, cause, transmission and prevention measure of malaria was found to be high. However, knowledge gaps about cause and transmission of malaria were also observed. It was recommended that there should be more awareness about the symptom, cause, transmission and prevention of malaria among the populace. Monitoring and counseling of people on the use of malaria vector control methods like LLIN. Government and NGOs should also help by creating more awareness on the use of other vector control methods like Indoor Residual Spray (IRS) and breeding site management.

Conflict of Interest

Authors declare that there is no conflict of interest reported in this work.

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