Awareness on the Prevention and Treatment of Malaria among Residents in Abraka, Delta State, Nigeria

EDJE, KE; DAUBRY, TME; NWANKWO, LU; MOKE, EG; ERHIRHIE, EO; ENAIGBE, O

1Department of Pharmacology and Therapeutics, Faculty of Basic Medical Sciences, Delta State University, Abraka, Delta State, Nigeria
2Department of Physiology, Faculty of Basic Medical Sciences, Delta State University, Abraka, Delta State, Nigeria
3Department of Pharmacognosy, Faculty of Pharmacy, Delta State University, Abraka, Delta State, Nigeria
4Department of Pharmacology and Toxicology, Faculty of Pharmaceutical Sciences, Chukwuemeka Odumegwu Ojukwu University, Awka, Anambra State, Nigeria

*Corresponding Author Email: hiligoodies@gmail.com; Tel.: +2347061040692

ABSTRACT: Nigeria, the most populous nation in the Sub-Saharan African region, remains ravaged with a high occurrence of malaria infections which accounts for one-fourth of malaria cases globally. Communal awareness is important in the total eradication of malaria in Africa and the world at large. This study is to ascertain the awareness of individuals in Abraka communities on the transmission, prevention and treatment of malaria. A cross-sectional survey was carried out among people of Abraka, Delta State, Nigeria, using 200 structured questionnaires. Data was presented as percentage (%) using descriptive statistics. Majority of the respondents were females (51%), 83.5% practiced Christianity, 63% of the subjects are single, and a total of 60.4% either into business, presented as percentage (%) using descriptive statistics. Majority of the respondents were females (51%), 83.5% practiced Christianity, 63% of the subjects are single, and a total of 60.4% either into business, or self-employed with 38% being students. Eighty-nine percent (89%) of the respondents indicated that mosquito bite is the mode of transmission of malaria and 82.5% of the respondents stated that refuse dump is the major factor that breed mosquito. A large number of the respondents (95%) have been engaged in one or more malaria preventive (control) methods. A greater percent (30%) commonly used artesunate in treating malaria, while 25% took Coartem® (artemether/lumefantrine), 23% took Lonart® (artemether/lumefantrine), 10% took quinine and 12% had other drugs they took for the treatment of malaria. There was much awareness on the spread, prevention and treatment of malaria in Abraka, Delta State.

DOI: https://dx.doi.org/10.4314/jasem.v24i7.23

Copyright: Copyright © 2020 Edje et al. This is an open access article distributed under the Creative Commons Attribution License (CCL), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Dates: Received: 16 May 2020; Revised: 29 June 2020; Accepted: 07 July 2020

Keywords: Antimalarial, communal awareness, artemisinin-based combination therapy (ACT), Abraka.

Malaria is a life-threatening protozoan disease caused by a Plasmodium parasite. For over 50,000 years, this disease has been a plague to the human race (WHO, 2011). There are four species of human plasmodium namely; P. falciparum, P. malariae, P. ovale and P. vivax (Paniker et al., 2003). In Nigeria, malaria is holo-endemic with P. falciparum as the dominant specie (Uko et al., 2002). Although, not a pandemic, malaria is alarmingly reputed as infectious epidemic disease and has remain a main cause of morbidity and mortality across the globe (Ashley et al., 2019). Africa is highly rated as the epicenter of the disease prevalence (WHO, 2019). Nigeria, the most populous nation in the Sub-Saharan African region, remains ravaged with a high occurrence of malaria infections which accounts for one-fourth of malaria case globally (Onyiri, 2015; WHO, 2019). Currently, therapeutic approach in the management of malaria infections depend majorly on orthodox medicines (especially the artemisinin-based combination therapy – ACT) (Pousibet-Puerto et al., 2016; WHO, 2018). Traditional herbal medicines have been used to treat malaria for thousands of years (Willcox and Bodeker, 2004), amongst other medicinal uses (Umehe et al., 2014; Moke et al., 2019; Okafo et al., 2019; Moke et al., 2020). Herbal remedies are still being employed by indigenous natives of the sub-Saharan African tribe to treat malaria (Ojezele et al., 2017; Ameade et al., 2018). The introduction of artemisinin together with other remedies have reduced malaria mortality rate in Africa by half (Prokurat, 2015). The rational use of an effective anti-malarial not only reduces the risk of the severe disease and shortens the duration of the illness, but also contributes to slowing down the development of the parasite's resistance (WHO, 2011). Research has shown that adequate knowledge, attitudes and practice (KAP) are very essential for the control and prevention of any disease (Arute et al., 2016). Communal
Awareness through proper education by healthcare professionals is a key in the total eradication of malaria in Africa and the world at large (Dawaki et al., 2016). Ascertaining the level of knowledge of malaria and attitude towards its treatment at the community level have been favorably recommended to be highly beneficial in the eradication process of malaria (Iwueze et al., 2013). The failure to consider community’s knowledge about malaria has contributed to the increase rate of malaria in Africa (Tyagi et al., 2005). Without a rational concept of the nature of a disease it is impossible to visualize a management procedure. Therefore, it is very crucial for local communities to have a sound understanding of malaria preventive measures and health seeking behavior (Esse et al., 2008).

Inadequate knowledge of disease coupled with wrong perception can result to delay in health seeking treatment (Okwa et al., 2012). Despite the documentation of several health compromising factors, different studies have emphasized the importance of adequate knowledge of malaria in order to ensure that individual apply preventive measures, and seek prompt and appropriate treatment for themselves and their household (Ahorlu et al., 2006). Hence, it is very essential that people’s knowledge and practices with regard to malaria is regularly assessed and promoted. Similar studies on the awareness and prevention of malaria have been carried out across six different communities in Delta State whereby 90.9% of respondents were found to be aware of the mode of transmission of malaria while 10% were not aware (Arute et al., 2016), but little or no study has been carried out in Abraka community on the awareness and prevention of malaria. Hence, the main objective of this study is to ascertain the knowledge of individuals in Abraka communities on the mode of transmission, prevention and treatment of malaria.

MATERIALS AND METHODS

The design of this study is cross-sectional study carried out in 2018. It is a community based survey comprising both males and females in Abraka, Delta State, Nigeria. The data for this research was collected using a total of 200 structured questionnaire corresponding to the research. The research was carried out in Abraka, which is one of the 25th Urhobo kingdoms in Delta State, Nigeria. It is situated at the eastern bank of River Ethiope in Ethiope East Local Government Area of Delta State (Ugbomeh and Atubi, 2010). Ethical approval was obtained from the ‘Ethical Committee of the Faculty of Basic Medical Sciences’. Informed oral consent was obtained from individual respondent as they willingly filled out well-structured questionnaires which were used as the instrument for data collection. The questionnaire comprised of information on socio-demographic characteristics, knowledge on malarial transmission, prevention and treatment. Data was presented as percentage (%) using descriptive statistics.

RESULTS AND DISCUSSION

The result from Table 1 indicates the socio-demographic data of the respondents. A greater proportion of the respondents were between the ages of 21-30 years which is about (39%). Majority of the respondents were females (51%), 83.5% practiced Christianity, 63% of the subjects are single, and a total of 60.4% either into business, employed or self-employed with 38% being students. The result from Table 2 shows the awareness of respondents on how malaria is transmitted. Eighty-nine percent (89%) of the respondents indicated that mosquito bite is the mode of transmission of malaria and 82.5% of the respondents stated that refuse dump is the major factor that breed mosquito. Majority stated correctly the signs and symptoms of associated with malaria.

| Table 1: Socio-Demographic Data |
|----------------------------------|
| **Parameters** | **Category** | **Frequency (%)** |
| **Age (years)** | 10 – 15 | 34 (17%) |
| | 21 – 30 | 78 (39%) |
| | 31 – 40 | 41 (20.5%) |
| | 41 – 50 | 36 (18%) |
| | 51 – Above | 11 (5.5%) |
| **Gender** | Male | 98 (49%) |
| | Female | 102 (51.00%) |
| **Marital Status** | Single | 126 (63%) |
| | Married | 62 (21%) |
| | Not Indicated | 12 (6%) |
| **Religion** | Christian | 167 (83.5%) |
| | Islam | 28 (14%) |
| | Not Indicated | 5 (2.5%) |
| **Education** | Primary School | 17 (8.5%) |
| | Secondary School | 61 (30.5%) |
| | Tertiary | 119 (59.5) |
| | None | 3 (1.5%) |
| **Occupation** | Students | 76 (38%) |
| | Traders | 31 (15.5%) |
| | Civil Servants | 42 (21%) |
| | Entrepreneurs | 9 (4.4%) |
| | Self-Employed | 39 (19.5%) |
| | Not Indicated | 3 (1.5%) |

The result from Table 3 showed that most of the respondents (82%) were aware that malaria can be prevented and 97.5% of the respondents stated that malaria can be cured. The result also showed that 92.5% of the subject stated that they have used environmental sanitation in preventing/controlling malaria, 86.5% have used insecticide spraying, 81% mosquito nets, 65% mosquito coil and 27% mosquito repellent. Furthermore, 71.5% indicated that the malaria preventive method was helpful while the remaining 28.5% said otherwise. Greater percentage (43.5%) treat malaria quarterly, this is followed by...
malaria is commonly transmitted?  

| Statement                  | Category       | Frequency (%) |
|----------------------------|----------------|---------------|
| How malaria is commonly transmitted? | Mosquito bite | 178 (89%) |
| Sex                        | 2 (2%)         |
| Drinking dirty water (germs) | 6 (3%)         |
| Don’t know                 | 11 (5.5%)      |
| Other                      | 3 (1.5%)       |
| Refuse dump and stagnant water | 168 (84%)     |
| Heap of books              | 5 (2.5%)       |
| Wearing black clothes at night | 10 (5%)       |
| I don’t know               | 17 (8.5%)      |
| Which of these factors help breed mosquito? | Fever and fatigue | 125 (62.5%) |
| Yes                        | 75 (37.5%)     |
| Headache and Joint Pain    | 118 (59%)      |
| Yes                        | 82 (41%)       |
| No                         | 30 (11.5%)     |
| Constipation               | 170 (88.5%)    |
| Body itching and boil      | 20 (10%)       |
| Yes                        | 180 (89%)      |
| No                         | 77 (37.5%)     |  

From the result, 31% of the respondents got their drugs prescribed by a pharmacist, family and friends (25.5%), doctors (24%), and by themselves (19.5%). A greater percent (30%) commonly used artesunate in treating malaria, while 25% took Coartem® (artemether/lumefantrine), 23% took Lonart® (artemether/lumefantrine), 10% took quinine and 12% had other drugs they took for the treatment of malaria. With regards to completion of medication, 80.5% of the respondents usually completed their malaria dose; about 52% felt relieved after taking medication, 11.5% felt partially relieved and 37.5% did not feel relieved. The findings of this study showed that general awareness about malaria, its prevention and treatment is high among residents of Abraka, Delta State. A total of 200 individuals from different locations in Abraka were randomly selected to participate in this study. The study revealed that a large percentage of people in Abraka (89%) were aware of the mode of transmission of malaria, which is through mosquito bite. This goes a long way in reducing the risk of getting infected with plasmodium parasite through mosquito bite. The observed knowledge about vector transmission may have been influenced by information, education and communication facilities which the respondents are exposed to.

The awareness of respondents on the factors that help breed mosquito was very high. A total of 82.5% were aware that refuse dump and stagnant water could be a breeding site for mosquito. This is similar with the research done by John et al., (2017) in Tanzania. Nevertheless, more awareness needs to be made on the factors that help breed the vector of the plasmodium parasite, as it cannot be over emphasized. Also, findings by John et al., (2017) in Tanzania showed that the individuals are fairly aware on the symptoms of Malaria (30%). This is much lower compared to the results of this present study where the knowledge on the symptoms of malaria was higher, with 62.5% and

| Table 3: Knowledge on the prevention and treatment of malaria | Statement                        | Category | Frequency (%) |
|-------------------------------------------------------------|----------------------------------|----------|---------------|
| Do you think malaria can be prevented?                      | Yes                              | 164 (82%)|
| No                                                          | 36 (18%)                         |
| Do you think malaria can be cured?                          | Yes                              | 195 (97.5%)|
| No                                                          | 5 (2.5%)                         |
| Do you carry out measures to prevent malaria?               | Yes                              | 196 (98%)|
| No                                                          | 4 (2%)                           |
| Have you ever used any of these methods in preventing malaria? | Environmental sanitation         | Yes      | 185 (92.5%)  |
| Insecticide spraying                                       | Yes                              | 173 (86.5%)|
| No                                                          | 27 (13.5%)                       |
| Mosquito nets                                               | Yes                              | 162 (81%) |
| No                                                          | 38 (19%)                         |
| Mosquito coil                                               | Yes                              | 130 (65%) |
| No                                                          | 70 (33%)                         |
| Mosquito repellants                                         | Yes                              | 54 (27%)  |
| No                                                          | 146 (73%)                        |
| Was the malaria preventive method useful?                   | Yes                              | 143 (71.5%)|
| No                                                          | 57 (28.5%)                       |
| How often do you treat malaria?                             | Weekly                           | 27 (13.5%)|
| Monthly                                                    | 44 (22%)                         |
| Quarterly                                                  | 87 (43.5%)                       |
| Yearly                                                     | 17 (8.5%)                        |
| None of the above                                          | 25 (12.5%)                       |
| Who prescribes your drugs?                                  | Doctor                           | 48 (24%)  |
| Pharmacist                                                 | 62 (31%)                         |
| Family and Friends                                         | 51 (25.5%)                       |
| Self                                                       | 39 (19.5%)                       |
| Which of these drugs do you most commonly use in treating malaria? | Coartem®                      | 50 (25%)  |
| Lonart®                                                    | 46 (23%)                         |
| Quinine                                                   | 20 (10%)                         |
| Artesunate                                                | 60 (30%)                         |
| Others                                                     | 24 (12%)                         |
| Yes                                                       | 161 (80.5%)                      |
| No                                                        | 39 (19.5%)                       |
| Do you feel relieved after taking treatment?                | Yes                              | 104 (52%) |
| Partially                                                  | 73 (37.5%)                       |
| No                                                        | 23 (11.5%)                       |
59% having a right knowledge of “fever and fatigue” and “headache and joint pain” respectively, as the symptom of malaria.

The knowledge of respondents on whether malaria can be prevented and cured was very high. It gave a result of 82% and 97.5% respectively. In agreement, a study conducted in Ethiopia reported higher knowledge of community on prevention and treatment of malaria (Aleme et al., 2011). It was observed that a large number of the respondents (95%) have been engaged in one or more malaria preventive (control) methods, with environmental sanitation having the highest percentage of 92.5%, followed by insecticide spraying 86.5%, mosquito nets 81%, mosquito coil 65% and mosquito repellant 27%. The result from this study is line with the research done across six different communities in other parts of Delta State, Nigeria by Arute et al., (2016) where 90.9% of the respondents were found to be aware of the mode of transmission of malaria. Also, findings by Randell et al., (2010) in a study in Mvomero, Tanzania, 83% of the respondents reported performing at least one of the different techniques for environmental sanitation to control malaria. Also, the study showed that about 43.5% of the respondents treat malaria quarterly which is quite often. According to the latest World Malaria Report released in November 2018 (WHO, 2018), it was observed that even with the various techniques to curb malaria, humans are still vulnerable to frequent malaria attack, especially under 5 years children (WHO, 2018). Artesunate which is a derivative of artemisinin, was seen in this work to be the most commonly used antimalarial drug with 30%. This could be due to its effectiveness and safety as recommended by WHO as one of the essential medicines for malaria treatment (WHO, 2018). Artemether/lumefantrine drug combinations were the most used for drug treatment of malaria, perhaps, because of its effectiveness as an artemisinin-based combination therapy (ACT) (Ștefan, 2015; Banda et al., 2019). However, it was observed in this study that a few percentages of those who completed their dose still felt partially relieved or not relieved at all. A systematic review on 55 studies carried out by Bruxvoort et al., (2014) showed that a large percentage of individuals who do not adhere to antimalarial treatment always return for medical treatment following frequent malaria attack.

**Conclusion:** There was much awareness on malaria prevention and treatment among residents in Abraka, Delta State. There was also a general acceptance by the respondents on the interventions employed to control malaria such as the use of insecticides, mosquito nets, mosquito coils, mosquito repellents and environmental sanitation. However, this did not appear significantly in reduction of malaria cases, as a high percentage of respondents showed that they still treat malaria quarterly despite the control methods.

**REFERENCES**

Ahorlu, CK; Koram, KA; Arholu, C; De Savigny, D; Weiss, MG (2006). Socio-cultural Determinant of Treatment delay for Childhood malaria in Southern Ghana. *Trop. Med. Int. Health.* 7:1022-1031

Aleme, A; Tesfaye, W; Golassa, L; Abebe, G (2011). Urban malaria and associated risk factors in Jimma town South-west Ethiopia published online. *Malar. J.* 10: 173.

Ameade, EPK; Ibrahim, M; Ibrahim, H; Habib, RH; Gbedema, SY (2018). Concurrent Use of Herbal and Orthodox Medicines among Residents of Tamale, Northern Ghana, Who Patronize Hospitals and Herbal Clinics. *Evid. Based Complementary Altern. Med.* 1289125: 1-8

Arute, JE; Okolosie-Patani, EO; Ahwinahwi, US; Agare, G (2016). A survey of the knowledge, attitude and practice of lay public's towards malaria in Delta state, Nigeria. *IRJPBS.* 3: 1-17.

Ashley, EA; Phylo, AP; Woodrow, CJ (2018). Malaria. *Lancet.* 391:1608–21.

Banda, CG; et al (2019). Efficacy and safety of arteether–lumefantrine as treatment for *Plasmodium falciparum* uncomplicated malaria in adult patients on efavirenz-based antiretroviral therapy in Zambia: an open label non-randomized interventional trial. *Malar. J.* 18: 180.

Bruxvoort, K; Festo, C; Kalolella, A; Cairns, M; Lyaruu, P; Kenani, M; Kachur, SP; Goodman, C; Schellenberg, D (2014). Cluster randomized trial of text message reminders to retail staff in tanzanian drug shops dispensing arteether-lumefantrine: effect on dispenser knowledge and patient adherence. *Am. J. Trop. Med. Hyg.* 91(4): 844-853

Dawaki, S; et al, YL (2016). Is Nigeria winning the battle against malaria? Prevalence, risk factors and KAP assessment among Hausa communities in Kano State. *Malar. J.* 15: 351

Esse, C; Utzinger, J; Tschanzen, AB; Raso, G; Pfeiffer, C; Granados, S; Koudou, BG; N’Goran, EK; Cisse, G; Girardin, O; Tanner, M; Obrist, B (2008), Social and cultural Aspect of Malaria and its Control in Cote d’voire. *Malar. J.* 7: 224-226
Iwueze, MO; Ezugbo-Nwobi, IK; Umeanetao, PU; Egbughe, CM; Anaso, CI (2013). Knowledge, attitude and management practices on malaria: A case study of Amansea, Awka North Local Government Area of Anamba State, Nigeria. The Bioscientist. 1(1):32-38

John, W; Kramer, K; Mandike, R; Nathan, R; Mohamed, A; Lynch, M; Brown, N (2017). Effectiveness and equity of the Tanzania National Voucher Scheme for mosquito nets over 10 years of implementation. Malar. J. 16: 255

Mokey, EG; Anachuna, KD; Edje, KE; Ojezele, MO (2019). Hepatoprotective effect of methanol seed extract of Citrus tangerina on paracetamol-induced hepatotoxicity in Wistar rats. Niger. J. Nat. Prod. Med. 23: 83-87

Mokey, EG; Mordi, JC; Umukoro, EK (2020). Effects of methanol leaf extract of Cuphea hysopofolia Kunth on liver enzymes activity and antioxidant indices of paracetamol-induced hepatotoxicity in Wistar rats. Afr. J. Biomed. Res. 23(1): 123-126

Ojezele, MO; Mokey, EG; Onyesom, I (2017). Impact of generic antimalarial or Phyllanthus amarus and vitamin co-administration on antioxidant status of experimental mice infected with Plasmodium berghei. Beni-Suef Univ. J. Basic Appl. Sci. 6: 260-265

Okafo, SE; Mokey, EG; Obi, CS (2019). Formulation and evaluation of anti-diabetic tablets containing aqueous extract of Moringa oleifera seeds. J. Pharm. Allied Sci. 16(5): 3167-3176

Okwa, OO; Soremekun, BM; Adaseko, O; Raheem, AM (2012). Artisans and traders’ Knowledge, Attitude and Practices of Malaria in selected areas of Lagos, Nigeria. GAR/MMMS. 3:68-74.

Onyiri, N (2015). Estimating malaria burden in Nigeria: a geostatistical modelling approach. Geospat. Health. 10: 306.

Paniker, J (2003). Textbooks of medical parasitology. 5th edn., Lordsdon publishers Limited, India, p. 64-93.

Pousibet-Puerto, J; Salas-Coronas, J; Sánchez-Crespo, A; Molina-Arrebola, MA; Sordinan- Pérez, MJ; Giménez-López, MJ; Vázquez-Villegas, J; Cabezas-Fernández, MT (2016). Impact of using arteisinin-based combination therapy (ACT) in the treatment of uncomplicated malaria from Plasmodium falciparum in a non-endemic zone. Malar. J. 15: 339

Prokurat, S (2015). Economic Outcomes of Malaria in South East Asia. In: M.Sitek, M.Lęski (eds) Opportunities for cooperation between Europe and Asia, Józefow, p.157-174

Randell, HF; Dickinson, KL; Shayo, EH; Mboera, LE; Kramer, RA (2010). Environmental management for malaria control: Knowledge and practices in Mvomero, Tanzania. EcoHealth. 7: 507-516

Ştefan, I (2015). Combination therapy--a way to forestall arteisinin resistance and optimize uncomplicated malaria treatment. J. Med. Life. 8(3): 326–328

Tyagi, P; Roy, A; Malhotra, MS (2005). Knowledge, awareness and practices towards malaria in communities of rural, semi-rural and bordering areas of east Delhi (India). J. Vector Borne Dis. 42: 30-5

Ugomeh, BA; Atubi, AO (2010). Preliminary Multivariate Analysis of the Factors of Socio-Economic Development of Nigeria – A Case Study of Delta State of Nigeria. Afr. Res. Rev. 4(4): 187-204

Uko, EK; Udoh, AF; Etukudoh, MH (2002). Reduced level of erythrocyte Glutathione (GSH) in malaria. J. Med. Lab. Sci. 11: 69-73

Umeh, VN; Ilodigwe, EE; Ajaghaku, DL; Erhirhie, EO; Mokey, EG; Akah, PA (2014). Wound-healing Activity of the Aqueous Leaf Extract and Fractions of Ficus exasperate (Moraceae) and its Safety Evaluation on Albino Rats. J. Tradit. Complement. Med. 4(4): 246-252

Willcox, ML; Bodeker G (2004). Traditional Herbal Medicine for Malaria. BMJ. 329: 1156-1159.

World Health Organization (2011). World Malaria Report.

World Health Organization (2018). World Malaria Report. Available at: https://www.who.int/malaria/publications/world-malaria-report-2018/en/

World Health Organization (2019). World Malaria Report. Available at: https://www.who.int/malaria/publications/world-malaria-report-2019/en/