

Full Length Research Paper

Choices of drugs for self-treatment of malaria among adult women in a Nigerian city: Implications for the success of the ongoing 'roll back' malaria programme

Jombo G. T. A.^{1*}, Mbaawuaga E. M.², Denen Akaa P.³, Alao O. O.⁴, Peters E. J.⁵, Dauda M. A.⁶, Okwori E. E.¹, Akosu T. J.⁷, Etukumana E. A.⁸ and Yaakugh J. B.¹

¹Department of Medical Microbiology and Parasitology, College of Health Sciences, Benue State University, P. M. B. 102119, Makurdi, Nigeria.

²Department of Biological Sciences, Faculty of Science, Benue State University, P. M. B. 102119, Makurdi, Nigeria.

³Department of Surgery, College of Health Sciences, Benue State University, Makurdi, Nigeria.

⁴Department of Haematology and Blood Transfusion, College of Health Sciences, Benue State University, P. M. B. 102119, Makurdi, Nigeria.

⁵Department of Internal Medicine, College of Medical Sciences, University of Calabar P. M. B. 1115, Calabar, Nigeria.

⁶Department of Histopathology, Faculty of Medical Sciences, University of Jos, Jos, Nigeria.

⁷Department of Community Health, Faculty of Medical Sciences, University of Jos, Jos, Nigeria.

⁸Department of Family Medicine, University of Uyo Teaching Hospital Uyo, Nigeria.

Accepted 24 August, 2018

Correct knowledge of current antimalarial drugs available for malaria treatment by Nigerians has a significant impact on the overall success of the ongoing national malaria control programme. This is as a result of a large segment of the communities, who more often than not, rely on self medications or as care givers influence the choice drugs for malaria treatment for their wards. The study was therefore set up to ascertain the types of drugs used for self medication of malaria among adult women in Makurdi city. The study was cross-sectional in nature involving adult women who were selected from households using systematic sampling methods. Quantitative information such as age, educational level, marital status, occupation and knowledge of malaria were obtained using structured and semi structured questionnaires, while qualitative information was obtained using focussed and in-depth group discussions to complement quantitative data. Those aware of existence of malaria were 97% (2,013/2075) with no significant age difference ($P > 0.05$) while 3.0% (62/2,075) with no knowledge of malaria all had no education ($P < 0.001$). There was a strong correlation between low economic status, low educational level and unemployment, and self medications for malaria (RR = 1.4 - 1.55). Several drugs with no antimalarial properties were mentioned by the respondents with the factors earlier stated still playing significant roles; and little or no mention was made of the artemisinin-based combination therapy (ACT) by the same group ($P < 0.05$). There should be a renewed sensitization and public awareness about the current trend in the control of malaria with special emphasis on the use of ACT; also introduction of home managers of malaria for commencement of intermittent preventive treatment should be considered a priority.

Key words: Drugs, self-medication, malaria, adult women.

INTRODUCTION

Malaria has continued to be a prominent undesired companion of African people even into the 21st century (Schellenberg et al., 2001; Jimoh et al., 2007; Kazembe et al., 2007). The disease has continued to wreck havoc

among her most vulnerable groups - pregnant women and children with an estimated 2-3 million deaths each year (Anumudu et al., 2007; Gwar et al., 2007; Oresanya et al., 2008). Due to the colossal loss of both human and

material resources occasioned by malaria on African soil, the disease is considered a serious potential threat to Africa's realization of the millennium development goals (MDGs) by the year 2015 (Trape et al., 2002; Baragatti et al., 2009).

In Nigeria, malaria is said to account for not less than 70% of all hospital and clinic attendances daily and 60% of all paediatric admissions and antenatal related morbidities (Olaogun et al., 2005; Ajayi, and Falade, 2006; Dada and Omokhodion, 2007). Management modalities for malaria related illnesses (MRI) among Nigerians are generally influenced by diverse socio-cultural factors which culminate into a particular treatment option by individuals and care givers (Isah et al., 2007; Ibadin et al., 2008; Adah et al., 2009). Malaria control in a community could be influenced to a large extent by the rate of utilization of available healthcare facilities, types of drugs used for self medication and pattern of intake, and level of care and importance attached to febrile illnesses generally (Mwenesi et al., 1995; Ahorlu et al., 2006; Idowu et al., 2008).

Makurdi city in north central Nigeria is not an exception to the present malaria burden in the country (Jombo et al., 2010). Also, the growing resistance to aminoquinolines generally and the recommendation for artemisinin combinations for malaria treatment by the ongoing RBM programme also calls for the need to assess the level of participation by individual communities towards this goal. Women generally have been found to play a significant role in the overall success of the RBM programme in African communities, either as caregivers to themselves during pregnancy, to their children as mothers, grand mothers or mother-in-laws, and also largely influence the type and nature of healthcare services for their spouses (Tarimo et al., 2000; Malik et al., 2006; Nsabagasani et al., 2007). It is in this light that the present study was carried out to ascertain factors influencing the types of treatment modalities for malaria and types of drugs used for self-treatment of malaria among women in Makurdi city, the associated factors and the overall impact on the ongoing malaria control programme in Africa (Bremont et al., 2007; Smith et al., 2008).

MATERIALS AND METHODS

Study area

The study was carried out in Makurdi, capital city of Benue state located in north central Nigeria and lies within latitude 7°44'N and longitude 8°35'E. The city has a population of about 700,000 inhabitants and serves as a link to most parts of northern and southern Nigeria for travellers criss-crossing the country. Makurdi experiences rainfall from April to October with an annual rainfall of 1500 mm - 1800 mm with mean night and day temperatures which

fluctuates between 30 and 40°C year round. At least 95% of the inhabitants of the city are Christians and the predominant tribes are Tiv, Idoma and Igede.

Procedure

The study was carried out between October and December, 2009. Six major parts of the city comprising high level, low level, Wurukum, north bank, Wadata and GRA were selected to cut across, ethnic, socioeconomic, and religious backgrounds of the inhabitants. Interviewers were trained on the art of questionnaire administration and subsequently recruited for the study. Households were selected using systematic sampling methods by the interviewers recruited into the study in which households in each direction faced one after another. Adult women, 18 years and above, in each household were individually interviewed to assess their knowledge about malaria and choices of drugs used for its self medication. Semi structured questionnaires with both closed and open ended questions were either self or interviewer administered to the respondents to obtain the information.

Information such as age, educational level, occupation, marital status, knowledge about malaria, choices of drugs for self medication of malaria and factors influencing their decisions were obtained. Focused group discussions and in depth discussions on myths and cultural practices surrounding choices of drugs chosen for self medication were also carried out where it was possible to assemble more than 10 adults in any location of the city; this qualitative data was used to strengthen the quantitative data obtained from the questionnaires.

Principal component analysis (PCA) was used to develop wealth indices for the households based on ownership of durable assets including radio, television, telephone, refrigerator, bicycle, motorcycle/scooter and car/truck. Ownership was coded as 0 or 1 and missing cases were excluded. The households were then divided into socio-economic quartiles based on their scores. Then Cronbach's alpha was calculated to test consistency-reliability (Ajayi et al., 2008).

Analysis of results

Data obtained were analysed using Epi Info 6 statistical software. Pearson's Chi squared test or Mantel-Haenszel were used to determine association with a P-value of 0.05 accepted as significant. Fisher's exact test was calculated for borderline significance and for cells with counts less than five. Logistic regression models were used to determine the predictors of modes of treatment as well as choices of drugs for treatment of malaria among the study population.

RESULTS

The age range of the 2,075 women studied in Makurdi was 18 to 83 years; the mean age was 37 years and mode 32 years; 97.0% (n = 2,013) of the respondents were aware of the existence of malaria while 87% (n = 1,751) were able to associate it with mosquitoes (Figure 1).

Based on age, all the respondents aged 60 years and above were aware of existence of malaria irrespective of educational levels. However, 3.0% (62/2,075) who had no knowledge about the disease were uneducated (P < 0.001). The level of awareness among those aged < 20,

*Corresponding author. E-mail: jombogodwin@yahoo.com.
Tel: +2348039726398.

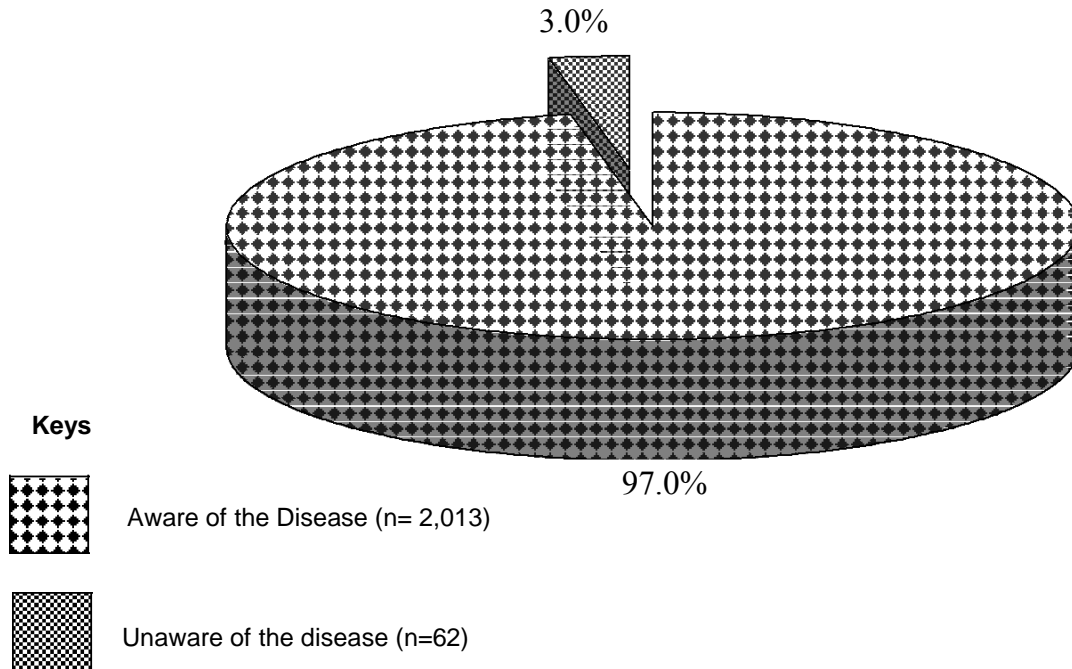


Figure 1. Level of awareness of the existence of malaria among adult women in Makurdi city, Nigeria.

20 - 29, 30 - 39, 40 - 49 and 50 - 59 years was respectively 91.5, 97.9, 98.2, 95.1 and 97.8% with no significant difference ($P > 0.05$) (Figure 2).

Analysis of the modes of treatment of malaria among the respondents showed that: 46.8% ($n = 972$) visit hospitals/clinics; 34.7% ($n = 721$) buy drugs from pharmacy/chemist shops; 8.3% ($n = 172$) visit traditional healers; 21.1% ($n = 438$) take herbs; 4.0% ($n = 83$) seek spiritual healing while 18.2% ($n = 378$) had no treatment option. There was strong correlation between hospital/clinic visitation and educational levels of the respondents ($CI = 1.25$, $RR = 1.4$), and also a higher economic status (3rd and 4th quartiles, $RR = 1.5$). Majority ($> 75\%$) of the civil servants, teachers/lecturers and health workers compared to $< 30\%$ recorded among other professions ($P < 0.05$) (Figure 3).

A review of the knowledge of antimalarial drugs among the respondents showed that 38.0% ($n = 562$) and 48.7% (1,011) of the respondents mentioned antifolates, artemisinin combinations, and chloroquine respectively while 6.8% ($n = 142$) mentioned paludrine/daraprim and amodiaquine. At least 8.8% ($n = 283$) of the respondents did not know any antimalarial drug. Various analgesics, haematinics, cough expectorants, and antibacterial drugs were listed as antimalarial drugs in different brand names. There was a strong correlation between the listing of a correct antimalarial drug and increasing educational level ($CI = 1.3$, $RR = 1.45$) while listing a non-antimalarial drug was common among those in the 1st and 2nd quartiles of economy compared to those in 3rd and highest quartiles ($RR = 5.5$). Those who used herbs

attested to the efficacious nature of them (Table 1).

DISCUSSION

Self medication through procurement of prospective antimalarial drugs over the counter without prescription was recorded in over 34% of the respondents. Although the correct dosages or otherwise of even the correct antimalarial drugs mentioned was not ascertained, a large contingent of drugs with no antimalarial properties were mentioned by the respondents.

Low educational levels, low family incomes, and lack of jobs were important contributory factors towards the people's resolve to self medication for malaria ($P < 0.05$) while proximity to health centres by households did not significantly influence it ($P > 0.05$).

A combination of large scale self medication for malaria with ineffective drugs coupled with other equally less effective treatment methods like intake of herbs and consultation of traditional healers among women in Makurdi city has the potential of slowing down the control process of the disease in the locality. It would also promote resistance of the Plasmodium species thus rendering treatment of the disease and prevention among pregnant women and children who are usually worst hit more difficult. The low level of awareness (< 0.5) of artemisinin combined therapy (ACT) among those familiar with self medication and virtual absence of home based managers (HBM) of malaria and community medicine distributors (CMD) in the city calls for urgent

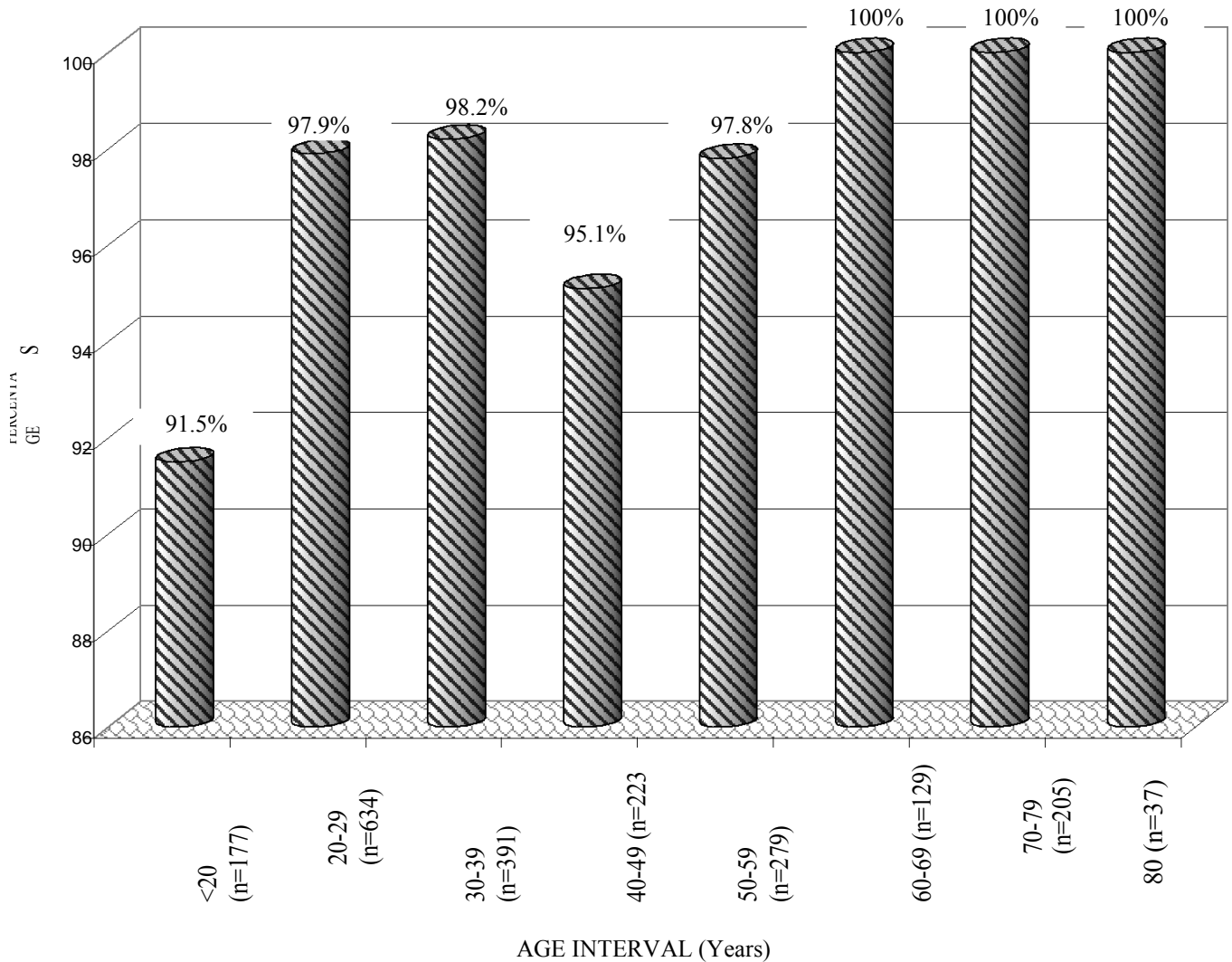
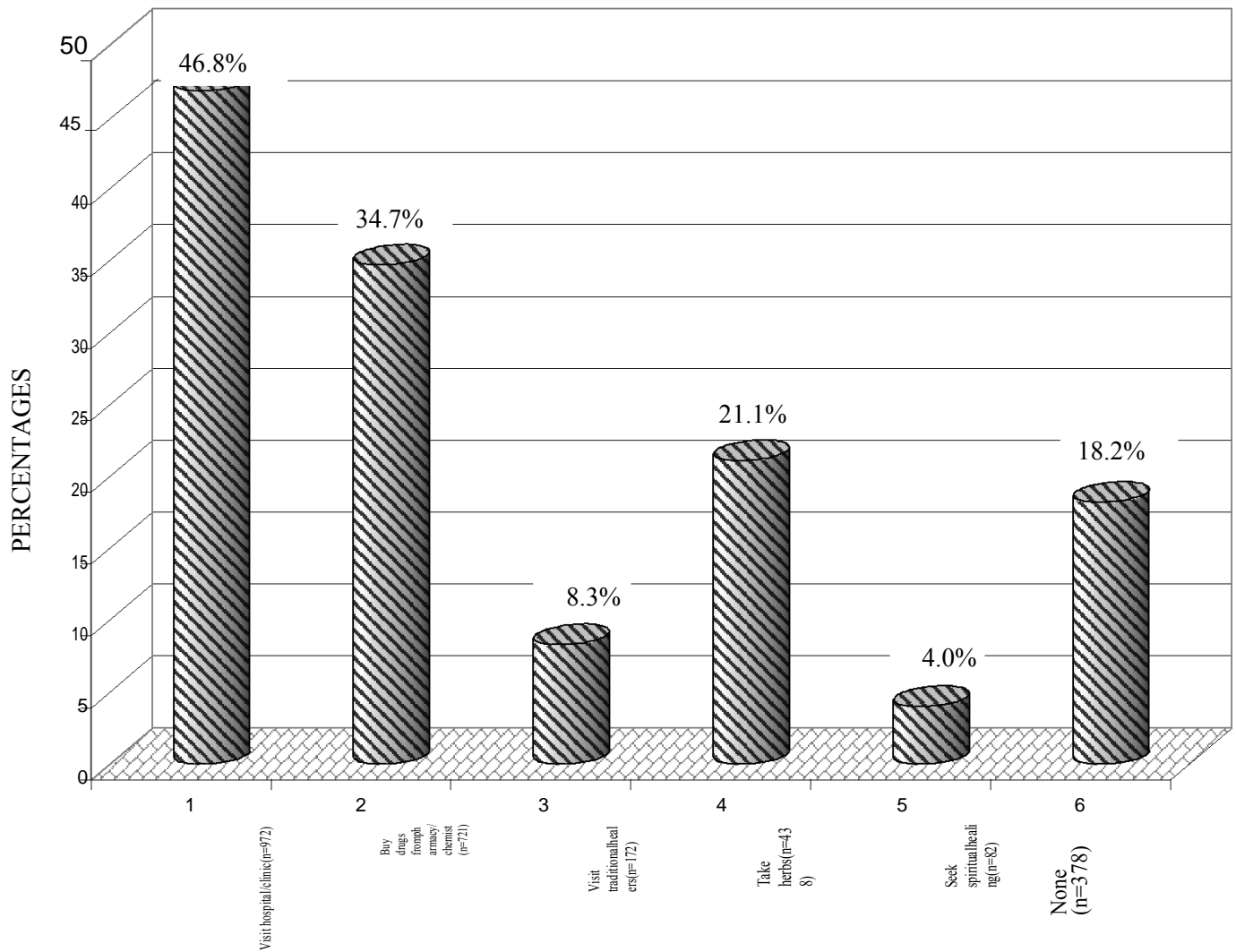


Figure 2. Rate of awareness of malaria in relation to age among adult women in Makurdi city, Nigeria (N=2,075).

attention from policy managers and implementers. The control of malaria was said to record significant success with the introduction of CMDs and HBMs in Uganda (Nsabagasani et al., 2007), Ibadan, Nigeria (Ajayi et al., 2008) and Dakar, Senegal (Faye et al., 1995). Voluntary health educators should be recruited among the people of the community to teach them about the dangers of self medication, discourage the use of chloroquine and introduce its appropriate dosages ACT, the mainstay of the present global malaria treatment and control programme (Leesay et al., 2008; Okech et al., 2008; Thang et al., 2009). Also intermittent preventive treatment malaria for the most vulnerable groups (pregnant women and children) with ACT, which is one of the cardinal components of the RBM programme but not yet in existence in the community, needs to be introduced through supply of these drugs to the people at minimal or no cost (Bhattarai et al., 2007; Kouyate et al., 2007).

The resolve to self medication and utilization of other treatment options for malaria outside hospitals/clinic visitations has similarly been found to significantly affect the control of malaria in Kenya (Mwenesi et al., 1995), Abeokuta (Dada and Omokhodion, 2007) and Jengre (Adah et al., 2009) in Nigeria, and in Ghana (Ahorlu et al., 2006). In order to make available the requisite antimalarial drugs to the people at their door steps, the CMDs and HBMs should be adequately equipped with bicycles or motorcycles and relevant audiovisual aids to properly educate the people on the current trends of malarial control including the preferred choices of drugs (Hill and Kazembe, 2006; Chambers et al., 2008; Deressa and Ali, 2009). Constitution of town hall meetings and regular town cries for city-wide malaria control would not be an exercise in futility but a worthwhile venture in a bid to convince the public to embrace the new results-oriented trends for global



MODES OF TREATMENT FOR MALARIA

Figure 3. Methods adopted for treatment of malaria by adult women in Makurdi city, Nigeria (N=2,075).

Table 1. Drugs used for the treatment of malaria among adult women in Makurdi city, Nigeria (2,075).

Drugs	Number	Percentage
Antifolates (eg Fansider, Fansimef, Amalar)	789	38.0
Artemisinin combinations (eg Amatem)	562	27.1
Chloroquine/quinine	1,011	48.7
Uncle Joe ¹	23	1.1
Paludrine, Daraprim, Amodiaquine,	142	6.8
Ampiclox	34	1.6
Fasygin ¹	72	3.5
Procold ²	56	2.7
Alabukum ¹	79	3.8
Paracetamol	378	18.2
By Doctors prescription	277	13.3

Table 1. Continued.

Feldene ³	92	4.4
Vitamin B complex	109	5.3
Vitamin C	78	3.8
A One ¹	43	2.1
Prepare herbs	184	8.9
Do not know	283	8.8
No response	473	13.2

Key: 1 = Pain killer, 2 = Expectorant, 3 = Opioid.

malaria control (Guyatt and Snow, 2004; D'Alesandro et al., 2005).

Conclusion

The present study has shown that illiteracy and economic factors were largely responsible for the people's resolve to self medication for malaria and attendant wrong choices of drugs to treat the disease. Policy formulators and implementers should seriously consider the possibility of introducing community drug distributors and home based managers for commencement of intermittent preventive treatment of malaria in the community as well as stepping up enlightenment and awareness campaigns about malaria so as to establish the new approach towards elimination of the disease from the community.

ACKNOWLEDGEMENT

We wish to express our deep appreciation to Dr Michael Odimayo, Jennifer Terna (Mrs), and Josephine Agbo (Miss), all of Department of Medical Microbiology and Parasitology, Benue State University Makurdi, Nigeria; and members of women fellowship, The Redeemed Christian Church of God, Makurdi Parish for effectively administering the questionnaires and participating in some of the FGDs.

REFERENCES

- Adah OS, Ngo-Ndomb T, Envaladu EA, Audu S, Banwat ME, Yusuf OT, Zoakah AI (2009). Home treatment of malaria amongst under fives presenting with fever in PHC facilities in Jos north LGA of Plateau State. *Niger. J. Med.*, 18(1): 88-93.
- Ahorlu CK, Koram KA, Ahorlu C, de Savigny D, Weiss MG (2006). Socio-cultural determinants of treatment delay for childhood malaria in southern Ghana. *Trop. Med. Int. Health*, 11(2): 1022-1031.
- Ajayi IO, Falade CO (2006). Pre-hospital treatment of febrile illness in children attending the General Outpatient Clinic, University College Hospital, Ibadan Nigeria. *Afr. J. Med. Med. Sci.*, 35: 85-91.
- Ajayi IO, Falade CO, Bamgboye EA, Oduola AMJ, Kale OO (2008). Assessment of a treatment guideline to improve home management of malaria in children in rural south-west Nigeria. *Malar. J.*, 7: e24.
- Anumudu CI, Okafor CMF, Ngwumohaike V, Afolabi KA, Nwuba RI, Nwagwu M (2007). Epidemiological factors that promote the development of severe malaria anaemia in children in Ibadan. *Afr. Health Sci.*, 7(2): 80-85.
- Baragatti M, Fournet F, Henry MC, Assi S, Ouedraogo H, Rogier C, Salem G (2009). Social and environmental malaria risk factors in urban areas of Ouagadougou, Burkina Faso. *Malar. J.*, 8: e13.
- Bhattarai A, Ali SS, Kachur SP (2007). Impact of artemisinin-based combination therapy and insecticide-treated nets on malaria burden in Zanzibar. *PLoS Med.*, 4: e309.
- Bremon JG, Alilio MS, White NJ (2007). Defining and defeating the intolerable burden of malaria III. Progress and perspectives. *Am. J. Trop. Med. Hyg.*, 77(6): 6-11.
- Chambers RG, Gupta RK, Ghebreyesus TA (2008). Responding to the challenge to end malaria deaths in Africa. *Lancet*. 371: 1399-1401.
- D'Alesandro U, Talisuna A, Baelaert M (2005). Should artemisinin-based combination treatment be used in the home-based management of malaria. *Trop. Med. Int. Health*, 10: 1-2.
- Dada OA, Omokhodion FO (2007). Home management of malaria by mothers of children under-five in Abeokuta, southwestern Nigeria. *Trop. Doct.*, 37(4): 217-219.
- Deressa W, Ali A (2009). Malaria-related perceptions and practices of women with children under the age of five years in rural Ethiopia. *BMC Public Health*, 9: e259.
- Faye O, Ndir O, Gaye O, Bah IB, Dieng I, Dieng Y, Diallo S, Diagne AK (1995). Health personnel and population practices in the diagnosis of malaria and use of antimalarial drugs in Dakar. *Med. Trop.*, 55(1): 47-50.
- Guyatt HL, Snow RW (2004). The management of fevers in Kenyan children and adults in an area of seasonal malaria transmission. *Trans. Roy. Soc. Trop. Med. Hyg.*, 98: 111-115.
- Gwar S, Newton CRJC, Berkley JA (2007). Over-diagnosis and co-morbidity of severe malaria in African children: A guide for clinicians. *Am. J. Trop. Med. Hyg.* 77(6): 6-13.
- Hill J, Kazembe P (2006). Reaching the Abuja target for intermittent preventive treatment of malaria in pregnancy in Africa women: a review of progress and operational challenges. *Trop. Med. Int. Health*, 11: 409-418.
- Ibadin OM, Ofili AN, Airauhi LU, Ozolua EI, Umoru AB (2008). Splenic enlargement and abdominal scarification in childhood malaria. Beliefs, practices and their possible roles in management in Benin city, Nigeria. *Niger. Postgrad. Med. J.*, 15(4): 229-233.
- Idowu OA, Mafiana CF, Luwaye IJ, Adehanloye O (2008). Perceptions and home management practices of malaria in some rural communities in Abeokuta, Nigeria. *Travel Med. Infect. Dis.*, 6(4): 210-214.
- Isah EC, Ofili AN, Ogbebor CE, Obahiagbon I, Isah AO (2007). Knowledge of malaria and the practices towards its control among urban dwellers in Benin City. *Niger. Postgrad. Med. J.*, 14(2): 125-128.
- Jimoh A, Sofola O, Petu A, Okorosobo T (2007). Quantifying the economic burden of malaria in Nigeria using the willingness to pay approach. *Cost Eff. Resour. Alloc.*, 22: e6.
- Jombo GTA, Mbaawuaga EM, Anongu ST, Egah DZ, Enenebeaku MNO, Okwori EE, Ejezie GC, Basseyy IE, Odey F (2010). Africa's 9th malaria day celebration in 2009 and its bearing on her most vulnerable groups: impact of malaria and associated anaemia among

- children in Makurdi city, north central Nigeria. In the Press. *Asia Pacific J. Trop. Med.*, 3(4): 294-297.
- Kazembe LN, Muula AS, Appleton CC, Kleinschmidt I (2007). Modelling the effect of malaria endemicity on spatial variations in childhood fever, diarrhoea and pneumonia in Malawi. *Int. J. Health Geogr.*, 6: e33.
- Kouyate B, Sie A, Ye M, De Allegri M, Muller O (2007). The great failure of malaria control in Africa: a district perspective from Burkina Faso. *PLoS Med.*, 4: e127.
- Leesay SJ, Casals-Pascual C, Erskine J, Anya SE, Duah NO, Fulford AJC, Sessay SSS, Abubakar I, Dunyo S, Sey O, Palmer A, Fofana M, Corrah T, Bojang KA, Whittle HC, Greenwood BM, Conway DJ (2008). Changes in malaria indices between 1999 and 2007 in The Gambia: A retrospective analysis. *Lancet*, 372(9649): 1545-1554.
- Malik EM, Hanafi K, Ali SH, Ahmed ES, Mohamed KA (2006). Treatment seeking behaviour for malaria in under five years of age: Implication for home management in rural areas with high seasonal transmission in Sudan. *Malar. J.*, 5: e60.
- Mwenesi H, Harpham T, Snow RW (1995). Child malaria treatment practices among mothers in Kenya. *Soc. Sci. Med.*, 40(9): 1271-1277.
- Nsabagasani X, Sabiiti JN, Kallander K, Peterson S, Pariyo G, Tomson G (2007). Home-based management of fever in rural Uganda: Community perceptions and provider opinions. *Malar. J.*, 6: e11.
- Okech BA, Mwobodia IK, Kaman A, Muiruri S, Mutiso N, Nyambura J, Mwatele C, Amano T, Mwandawiro CS (2008). Use of integrated malaria management reduces malaria in Kenya. *PLoS ONE*. 3(12): e4050.
- Olaogun AA, Ayandiran O, Olasode OA, Adebayo A, Omokhodion F (2005). Home management of childhood febrile illness in a rural community in Nigeria. *Rural Health*, 13: 97-101.
- Oresanya OB, Hoshen M, Sofola OT (2008). Utilization of insecticide-treated nets by under-five children in Nigeria: Assessing progress towards the Abuja targets. *Malar. J.*, 7: e145.
- Schellenberg JB, Abdulla S, Nathan R, Mukasa O, Marchant TJ, Kikumbih N, Coast EE (2001). Effect of large-scale social marketing of insecticide-treated nets on child survival in rural Tanzania. *Lancet*, 357: 1241-1247.
- Smith AD, Bradley DJ, Smith V, Blaze M, Behrens RH, Chiodini PL, Whitty JM (2008). Imported malaria and high risk groups: Observational study using UK surveillance data 1987-2006. *B.M.J.*, 337(7661): 103-106.
- Tarimo DS, Lwihula GK, Minjas JN, Bygbjerk TC (2000). Mother's perceptions and knowledge on childhood malaria in the holendemic Kibaha district, Tanzania: Implications for malaria control and the IMCI strategy. *Trop. Med. Int. Health*, 5(3): 179-184.
- Thang ND, Erhart A, Hung LX, Thuan LK, Xa NX, Thanh NN, Ky PV, Coosemans M, Speybroeck N, D'Alessandro U (2009). Rapid decrease of malaria morbidity following the introduction of community-based monitoring in a rural area of central Vietnam. *Malar. J.*, 8: e3.
- Trape JF, Pison G, Spiegel A, Enel C, Rogier C (2002). Combating malaria in Africa. *Trends Parasitol.*, 18: 224-230.