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**Article** *in* Tropical Doctor · November 2007

DOI: 10.1258/004947507782332946 · Source: PubMed



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# Pattern of antimalarial prescriptions for children and pregnant mothers by private medical practitioners in Ilorin, Nigeria

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*TROPICAL DOCTOR* 2007; **37**: 212–214

**SUMMARY** A survey of the prescription practices of private medical practitioners (PMPs) in four local government areas in Kwara State, Nigeria, was carried out using a self-administered pre-tested questionnaire. A total of 49 respondents from 40 private health facilities participated in the survey. The prescription practice of a significant number of PMPs was not in conformity with the National Malarial Treatment policy. There was inadequate knowledge of the classification of malaria; hence, many of the respondents could not recognize severe malaria. Regular continuing medical education and distribution of information, education and communication materials on malaria to private health facilities are strongly recommended.

## Introduction

In sub-Saharan Africa, *Plasmodium falciparum* malaria is a major cause of morbidity and mortality in children under five years of age.[1] Early diagnosis and treatment are fundamental to the global strategy for malarial control.[2] The National Malaria Control Programme has conducted a series of cascade training on malaria case management in Nigeria. Despite these efforts, it appears that the private medical practitioners (PMPs) have not been adequately addressed. Many times, PMPs are often driven by the need to retain the patient's patronage and maintain their popularity in a highly competitive environment.[3] They may therefore constitute a significant reservoir of inappropriate prescription practices that may promote parasite drug resistance.[4] In Nigeria, the role of PMPs in the malaria control strategies has not been systematically studied. The purpose of this study was to study the pattern of the prescription of antimalarial drugs among PMPs, as they relate to children and pregnant women, with a view to highlighting their strengths and deficiencies and evolving intervention strategies where necessary.

## Materials and methods

The study was conducted in Ilorin, capital of Kwara State, which is located in the north central geopolitical region of Nigeria. The population of Ilorin is about 750,000, while that of Kwara State is 2.5 million. The subjects were PMPs practising within four local government areas (LGAs) of the state. The LGAs covered were Asa, Ilorin East, Ilorin West and Ilorin South.

A distribution of available health clinics or hospitals was obtained from the Board of Registration of Private Hospitals/Clinics in the state. Thereafter, the authors visited every private clinic/hospital identified. The survey was carried out between January and March 2002, using a self-administered pre-tested questionnaire. The questionnaires covered, but were not limited to, questions on personal data, choices of malaria chemotherapy for children, chemoprophylaxis/chemotherapy for pregnant mothers and drugs for treatment of severe malaria. Data were managed using the EPI6.04d management software. Frequencies, means, standard deviations and percentages were then computed.

## Results

A total of 55 questionnaires were administered, out of which 49 were analysed. The remaining six could not be retrieved. Out of 48 respondents who had stated their post-qualification years of practice, 17 (35.4%) had $<10$ years post-qualification experience, 10 (20.8%) had 10–20 years, 15 (31.3%) had 21–30 years, five (10.4%) respondents had 31–40 years, whereas only one (2.1%) respondent had $>40$ years post-qualification experience. The mean post-qualification experience of all the respondents was 17 years.

### *Malaria chemotherapy in children*

Most of the respondents, 47 (96%), prescribed chloroquine as their first-line drug; the remaining used either sulphadoxine–pyrimethamine (SP) or quinine. The main reasons adduced by the majority of respondents for their choice of first-line antimalarial drug were low cost 44 (90%), availability 43 (88%) and early onset of action 40 (82%). The preference of PMPs for second-line antimalarials was mainly SP 21 (43%). The reasons for the choice of second-line drugs by 38 (78%) and 35 (71%) respondents included the ease/readiness of availability and compliance in children, respectively.

The preferred routes of administration of these drugs by the respondents were as follows: oral 17 (35%), intramuscular/subcutaneous route 11 (22%), initial intramuscular followed by oral route among 20 (41%), and one PMP preferred to give it intramuscularly. Most of the respondents preferred the oral route because it gives rapid relief to children. The dosage of oral chloroquine was written correctly by 19 (48%) respondents, whereas that for parenteral chloroquine was correctly stated by 14 (36%) of the 40 respondents who routinely used the drug. Fourteen (35%) respondents still give chloroquine as a twice-daily dosage.

With respect to dosages of other antimalarials, these were correctly stated by the number of respondents shown against each drug in Table 1. Some of the respondents did not prescribe some of these drugs at all. These include 20 (48.8%) who did not prescribe artemisinin derivatives, 29 (68%) for SP + mefloquine and 10 (22%) for quinine (Table 1).

### *Malaria chemotherapy and chemoprophylaxis in pregnancy*

The majority of respondents, 44 (92%), used chloroquine as the first-line antimalarial drug for the treatment of

**Table 1** Choice of antimalarial drugs for children under five years by private medical practitioners

| Drug | Frequency of respondents (%) |
|---|---|
| First-line antimalarial drug used for uncomplicated malaria | |
| Chloroquine | 47 (96) |
| SP combination | 1 (2) |
| Quinine | 1 (2) |
| Total | 49 (100) |
| Choice of second-line antimalarial drugs | |
| SP | 21 (43) |
| Halofantrine | 11 (22) |
| Amodiaquine | 5 (10) |
| SP and mefloquine | 5 (10) |
| Quinine | 3 (6) |
| Chloroquine | 3 (6) |
| Artemether | 1 (2) |
| Total | 49 (100) |
| Route of administration preferred with first-line drug | |
| Oral | 17 (35) |
| Intramuscular or subcutaneous | 11 (22) |
| Intramuscular | 1 (2) |
| Intramuscular or subcutaneous followed by oral | 20 (41) |
| Total | 49 (100) |
| Correct dosing of the drugs | |
| Oral chloroquine | 19/40 (48) |
| Parenteral chloroquine | 14/39 (36) |
| SP | 29/47 (62) |
| Amodiaquine | 5/47 (11) |
| Halofantrine | 41/47 (87) |
| Artemisinin derivatives | 6/39 (15) |
| Artemether/parenteral artesunate | 10/41 (24) |
| Fansimef | 15/46 (33) |
| Quinine | 16/45 (36) |

SP, sulphadoxine–pyrimethamine

mothers with uncomplicated malaria in all trimesters of pregnancy. Very few respondents, two (4%) and three (6%) used SP as the first-line drug in the first and second/third trimesters of pregnancy, respectively. Furthermore, the majority of respondents, 40 (82%), still used pyrimethamine as chemoprophylaxis in pregnancy, whereas one (2%) and four (8%) respondents gave SP for intermittent preventive therapy (IPT) and weekly chloroquine therapy, respectively (Table 2).

### *Management of severe malaria*

Of the 49 respondents who responded to the question 'what is severe malaria', only two (4%) respondents gave the correct answer based on the most basic definition. Twenty-seven (55%) of the respondents gave partially correct answers, whereas five (10%) gave incorrect answers. The remaining 15 (31%) of these respondents could not give any definition for severe malaria. Furthermore, 19 (39%) respondents correctly identified the listed features of severe malaria, whereas the remaining 30 (61%) did not identify some of the important features of severe malaria. The most frequently identified features of severe malaria were altered consciousness, hyperpyrexia, severe anaemia and convulsions. The majority of respondents, 34 (69%), would give quinine injection and 11 (22%), would have given parenteral chloroquine, whereas the remaining four (8%) would administer parenteral artemether as the preferred drug for severe malaria.

**Table 2** Malaria prevention/chemotherapy in pregnancy

| Drug | Frequency of respondents (%) |
|---|---|
| Malaria prevention in pregnancy | |
| Weekly pyrimethamine | 40 (82) |
| Weekly chloroquine (300 mg) throughout pregnancy | 4 (8) |
| Oral chloroquine four tablets immediately then 300 mg monthly throughout pregnancy | 4 (8) |
| Intermittent SP given as three tablets at starting in second and early third trimesters | 1 (2) |
| Total | 49 (100) |
| First drug of choice for malaria chemotherapy in the first trimester | |
| Chloroquine | 44 (92) |
| SP | 3 (6) |
| Halofantrine | 1 (2) |
| Total | 48 (100) |
| First drug of choice for malaria chemotherapy in the second and third trimesters | |
| Chloroquine | 45 (92) |
| SP | 4 (8) |
| Total | 49 (100) |

SP, sulphadoxine–pyrimethamine

## Discussion

This study revealed some gaps in the knowledge of PMPs in this part of Nigeria on malaria management. The knowledge and antimalarial prescription practice for children by PMPs were generally not in conformity with the National Antimalarial Treatment Policy. There were still problems of incorrect drug dosing (which could lead to poor treatment of malaria and emergence of resistant strains, which may later affect the newer artemisinin-based combination therapy and understanding the concept of severe malaria (which may be due to the fact that it is a recent concept taught only to the graduates of medicine in the last 10 years). Malaria chemoprophylaxis for pregnant mothers has still not changed from the obsolete and ineffective weekly pyrimethamine despite a clearly spelt out national policy of IPT in pregnancy.[5,6] Regular continuing medical education and distribution of information, education and communication materials on malaria to PMPs are strongly recommended to stem this tide.

### *Acknowledgements*

We are immensely grateful to PMPs practising in the four LGAs, where the survey took place, for their participation. We also appreciate the useful advices of Dr L Odeigah of the Department of General Medical Practice, University of Ilorin Teaching Hospital, Ilorin, Nigeria.

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# Low prevalence of malnutrition in a rural Nigerian community


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*TROPICAL DOCTOR* 2007; **37**: 214–216

**SUMMARY** This study was carried out to determine the prevalence of malnutrition in a rural Nigerian community. Using the modified Wellcome Classification, the prevalence of protein energy malnutrition (PEM) was 20.5%. The prevalence of underweight, wasting and stunting were 23.1%t, 9% and 26.7%, respectively. The low prevalence of PEM in this rural Nigerian community may be due to the services and intervention provided by a non-governmental organization in the community. This method of intervention is similarly achievable in any other community.

## Introduction

Protein energy malnutrition (PEM) is the second most important cause of childhood morbidity and mortality in Nigeria after infections.[1] It is a direct cause of death in 2% of the children under the age of five years and an underlying factor in 60% of the more than 10 million child deaths that occur each year.[2] The World Health Organization estimates that approximately 150 million children under five years in developing countries are underweight and an additional 200 million children are stunted.[3] In Nigeria, 34%, 16% and 27% of the children under the age of five years in rural areas are reportedly underweight, wasted and stunted, respectively, whereas 22%, 14% and 25% of those in urban areas are reportedly underweight, wasted and stunted, respectively.[4]

Malnutrition remains a major public health problem and it appears to be getting worse in selected settings.[5] This prospective study was, therefore, undertaken to determine the current nutritional status of children under the age of five years in Ifewara, Osun State, as an index of the wellbeing of Nigerian children. It is expected to provide data that may assist in the formulation of the necessary preventive and treatment strategies, particularly in this community.

## Subjects and methods

This study was carried out in Ifewara, a rural community located in Atakunmosa West Local Government Area, Osun State, southwestern Nigeria. Ifewara with an estimated population of 3927 and a household count of 1849 is located 18 km from Osu, the headquarters of the local government area, 36 km from Osogbo, the capital of Osun State and 200 km from Lagos, a former federal capital city. Free basic health services are provided by a non-government organization (NGO), which runs a clinic in the community. They conduct a bi-weekly monitoring of anthropometry of all children under the age of five years in the community with the provision of necessary interventions. They also treat common ailments such as malaria, diarrhoea and acute respiratory infections.

Multistage cluster and random sampling techniques were used to select households and subjects. All children under the age of five years in the entire households of the selected houses were studied. In each household, information was obtained on demographic, socioeconomic and environmental characteristics. The anthropometric parameters of every child were recorded and each child was clinically examined for gross evidences of malnutrition.

Standardization checks on the tools for anthropometric measurements were carried out periodically. Children with evidences of chronic diseases were excluded.

Malnutrition was diagnosed clinically using the modified Wellcome System of Classification.[6] The National Centre for Health Statistics/World Health Organization guidelines and cut-off points[7] were also used to determine the degree of stunting, underweight and wasting. Underweight, wasting and stunting were diagnosed when the weight-for-age (WA), weight-for-height (WH) and height-for-age (HA) were equal to minus two standard deviation ($-2$ SD) or below the mean of this reference international standards, respectively.[7] Data analysis was carried out using the Epi info 2002 software. Personal and family data were separately analysed to avoid data duplication. Proportions and rates were compared using the Pearson $\chi^2$ test. $P$ values less than 0.05 were accepted as statistically significant.

## Results

### *Demography*

A total of 420 children were studied from 344 households consisting of 348 mothers and 344 fathers. The mean age of the study population was $35.4 \pm 14$ months. Sex distribution shows that 218 (51.9%) children were females, whereas 202 (48.1%) were males giving a female:male ratio of 1.1:1.

### *Prevalence and types of PEM*

Using the modified Wellcome Classification, 334 (79.5%) were normal whereas 86 (20.5%) children were malnourished. While there were no cases of kwashiorkor, underweight kwashiorkor, marasmic kwashiorkor and overweight, 82 (19.5%) of these children were underweight and four (1%) had marasmus. The influence of age on the WA $Z$-score (WAZ), HA $Z$-score (HAZ) and WH $Z$-score (WHZ) is as shown in Table 1. The prevalence of underweight was significantly highest in the second year of life ($\chi^2 = 13.3$, $P = 0.004$). The prevalence of wasting was also highest in the same age group but decreased with increasing age and rose again in the fifth year of life. The trend was, however, not statistically significant ($\chi^2 = 4.23$, $P = 0.237$). The prevalence of stunting showed a slight variation among the different age groups, with the highest