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Pre-hospital treatment of febrile illness in children attending the General Outpatients Clinic, University College Hospital, Ibadan, Nigeria

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Summary

Many childhood febrile illnesses are treated at home prior to presentation. This study gathered information on treatment practices of caregivers for febrile illnesses in an urban area. A Cross sectional survey of consenting guardians of 535 consecutive febrile children under 10 years presenting at General Outpatients' (GOP) Clinic, University College Hospital, Ibadan was carried out. Thick blood smears were examined for malaria parasite. The mean (SD) age of the febrile children was 3.2 (2.8) years. Nineteen (17.5%) children were brought within 24 hours of noticing fever. Malaria was presumed to be the diagnosis by 217 (40.6%) respondents; 247 (46.2%) did not know the cause of fever. Most, 469 (87.7%) respondents gave drugs bought from chemists/pharmacy shops before presentation at the GOP. Paracetamol [380 (81.0%)] and chloroquine [171 (36.5%)] were the most commonly used drugs. Twenty-six (15.2%) respondents used chloroquine correctly. One hundred and ninety-nine of 476 children (41.8%) were smear positive and 88 of 191 (46.1%) children whose guardians presumed malaria had parasites. This study reiterates the fact that majority of childhood febrile illnesses are first treated at home. It underscores the need to empower caregivers by appropriate education on knowledge, attitude and practice of the management including home management of malaria.

Keywords: *Febrile illness, home treatment, diagnosis, outpatient clinic.*

Résumé

Plusieurs accès févrique dans l'enfance sont traités à la maison avant la présentation à la clinique. Cette étude assemble les informations sur les pratiques de traitement des accès févrique par des personnels des soins de santé en zone urbaine. Une surveillance d'une section des parents des enfants de moins de 10 ans ayant la fièvre en clinique générale, au Centre Universitaire Hospitalier de l'université of Ibadan, était faite. Leurs gouttes épaisses étaient examinées pour le parasite du paludisme. La moyenne d'âge des enfants ayant la fièvre était de 3.2 (2.8) ans. 17.5% (19) des enfants étaient présentés entre 24 heures de la maladie. Malaria était présumé diagnostiquer chez 217 (40.6%), 247 (46.2%) ne connaissait pas la cause de la fièvre. 469 (87.7%) des participants administraient les

médicaments achetés soit dans une boutique ou en pharmacie avant la présentation à la clinique. La prise du paracétamol {380(81.0%)} et la chloroquine {171(36.5%)} étaient plus commun. 15.2% des participants utilisaient la chloroquine effectivement. 199 sur 476 (41.8%) enfants avaient des gouttes épaisses positives et 88 sur 191 (46.1%) enfants que les parents présumaient qu'ils avaient le paludisme. Cette étude ré-interprete le fait que la majorité de enfants à l'état févrique sont d'abord traités à la maison. Ceci appelle le besoin d'armer les personnels de soins de santé avec une éducation appropriée. L'attitude et la pratique des soins de ménageement inclus le ménageement à domicile.

Introduction

Febrile illnesses in children constitute a common presentation at health facilities in Nigeria and other countries in sub-Saharan Africa [1,2]; the major cause being malaria and respiratory tract infections. In countries where malaria is highly endemic, anti-malaria drug treatment of all young children with fever is recommended when diagnosis cannot be confirmed by microscopy [3]. Home treatment for childhood febrile illnesses is a common practice among caregivers in Nigeria [4,5,6] as well as some other endemic countries in sub-Saharan Africa [7,8,9]. In Togo only 20% of the children with suspected fever are seen at a health centre, while the remaining 80% are treated at home with an anti-malaria drug [7]. In Nigeria between 60% and 80% of children would have been treated at home prior to reporting at health facilities [4]. Majority of these children are treated with anti-malarial drugs.

Provision of correct treatment to such a large target group is, however, a major challenge and in responding to it, it is important to know what role parents play in treating febrile children and to decide the appropriateness of this role. Health seeking behaviour have been shown in past studies to be influenced by several factors such as: accessibility and availability of drugs, availability of health personnel, cost of treatment including drugs, perception of seriousness of disease, knowledge of causation and ability to diagnose and treat [10, 11]. Most of these studies were carried out in the context of home treatment of fever using household survey and mostly in the rural areas.

This study gathered information on the treatment practices of caregivers in an urban area for febrile illnesses prior to presentation at a health facility and their knowledge of the causation and prevention of malaria. Also, the correctness of the treatment given at home prior to clinic visit and the presumed diagnoses by guardians and physicians in the clinic was determined.

Materials and methods

Cross sectional descriptive study design was used. Every consenting parent/guardian of consecutive febrile children under the age of 10 years presenting for the first time at the GOPD UCH Ibadan, were interviewed using a structured questionnaire between July 1999 and Jan 2000).

Study area

The GOP clinic is a General Medical Practice/Family Medicine residency training center at the University College Hospital, Ibadan. Ibadan is in the southwestern part of Nigeria and endemic for malaria. The major ethnic group in this city is the Yorubas. More than 15,000 patients from Ibadan city and its environs are treated at the GOP clinic annually. Children constitute 40.0% of these patients [12].

Operation of the clinic

Clinics are held daily from Monday through Friday between 8.00am and 4.00pm and on Saturdays between 8am and 1.00pm. In the mornings of the clinic days, new patients are assembled in a sorting hall and sorted by senior doctors according to the nature of their illnesses. Selected patients are registered while others are treated accordingly or referred to appropriate specialist. While waiting, adult patients get their blood pressure measured and urinalysis done; and the paediatric patients get their weights and temperature measured by the nurses. Febrile children have thick blood smears prepared for malaria parasite at the GOP laboratory. The smears are examined by experienced microscopists.

The febrile children were managed as done routinely for all febrile children including clinical examination and laboratory examination for malaria parasite. Drugs were subsequently prescribed based on the physician's diagnosis and were followed up until recovery. Those that were severely ill and required admission were referred to the Children's Emergency Ward of the hospital. The axillary temperatures were measured to the nearest 0.1°C taken using a clinical thermometer. For the purpose of this study, fever was taken as axillary temperature $\geq 37.5^\circ\text{C}$ (13). A blood film for malaria parasites was done for the febrile children at time of presentation prior to treatment.

The questionnaire designed for the study was translated from English to Yoruba and back translated to English. It was face validated and subsequently pre-tested among ten patients (English and Yoruba speaking) attending the clinic. Interview was conducted by a trained research assistant and the clinical examinations were done by the attending physician. Guardians who were English speaking were interviewed in English while those who were Yoruba speaking had their interviews in Yoruba. Guardians who did not speak English or Yoruba had an interpreter to translate the questions to them. The information collected include demographic characteristics of the febrile child and those of the guardians, other presenting symptoms in the febrile child, guardians' presumed diag-

nos, the treatment given to the febrile child prior to presentation in the clinic and knowledge of cause and prevention of malaria.

Clinical and laboratory details of patients were recorded in case record forms. In addition, the physicians' presumed diagnosis of the illness prior to receiving the result of blood smear was recorded.

The data collected were analysed using EPI INFO version 6 statistical package software. Descriptive statistics such as frequency distribution, means and standard deviation were used to describe and summarise the data. Chi square and t-test statistics were used to compare proportions and means respectively. To determine the correctness of the diagnosis of both the physicians and parents/guardians, the presumed diagnoses were dichotomised to malaria and others. The level of significance was at 5%.

Ethical approval for conduct of this study was obtained from the Joint UI/UCH Ethical Review Committee.

Results

Five hundred and thirty-five febrile children were studied. The demographic characteristics of the febrile children and that of their guardian are shown in Tables 1 and 2 respectively.

Table 1. Frequency distribution of some of the characteristics of the febrile children. (N=535)

Characteristics	Frequency	%
<i>Age group (Years)</i>		
0-1	179	33.5
>1-3	156	29.2
>3-5	90	16.8
>5-10	110	20.6
Mean (SD) = 3.2 (2.8) years		
<i>Sex</i>		
Male	249	46.5
Female	286	53.5
<i>Duration of fever prior to presentation (Days)</i>		
1	92	17.2
2	20	3.7
3	191	35.7
4	80	15.0
5	52	9.7
6	22	4.1
7	29	5.4
>7	39	7.3
Not stated	10	1.9

The mean (SD) age of the febrile children was 3.2 (2.8) years with a range of 2 weeks to 10 years. The mean (SD) age of the guardians was 30.4 (8.3) years. 302 (56.4%) of them were "Yorubas". One hundred and ninety-five (36.4%)

febrile children were brought to the hospital 3 days after guardian noticed fever. The mean (SD) number of days child was brought to GOP clinic after noticing fever was 4.0 (3.3) days. Only 19 (17.5%) were brought within 24 hours of onset of fever.

Table 2. Frequency distribution of the socio-demographic characteristics of the accompany persons. (Respondents) (N=535)

Characteristics	Frequency	%
<i>Age group(years)</i>		
13-20	59	11.0
21-30	261	48.9
31-40	161	30.1
41-50	35	6.5
>50	13	2.4
Not Stated	6	1.1
<i>Level of Education</i>		
None	140	26.2
Primary	122	22.8
Secondary	183	34.2
Polytechnic/College	43	8.0
University	36	6.7
Not stated	11	2.1
<i>Ethnic</i>		
Yoruba	302	56.4
Hausa	153	28.6
Others (Ibo, Urhobo, Isan)	47	8.8
Not stated	33	6.2
<i>Religion</i>		
Christianity	230	43.0
Islam	293	54.8
Traditional	12	2.2
<i>Occupation</i>		
Petty Trading	244	45.6
Housewife	130	24.3
Artisan	61	11.4
Teaching	31	5.8
Unemployed	16	3.0
Civil Servants	10	1.9
Student	11	2.1
Professional	4	0.7
Farmer	1	0.2
Not Stated	27	5.1
<i>Relationship of respondents to child</i>		
Mother	466	87.1
Grand Mother	24	4.5
Sister	14	2.6
Aunt	11	2.1
Father	12	2.2
Step mother	6	1.1
Brother	2	0.4

Pattern of febrile illness

The other symptoms and signs among the febrile children at presentation apart from fever are shown in Table 3. The commonest was cough, mentioned by 250 (46.7%) followed by vomiting, mentioned by 154 (28.8%).

Table 3. Other presenting symptoms among febrile children enrolled into the study. (N=535)

Symptoms	Freq	%
Cough	250	46.7
Vomiting	154	28.8
Anorexia	107	20.0
Diarrhoea	81	15.1
Headache	54	10.1
Abdominal Pain	40	7.5
Chills	32	6.0
Yellow eyes	13	2.4
Convulsion	12	2.2
Yellow urine	7	1.3
Body aches and pain	4	0.8
Excessive sweat	3	0.6

Note: There were multiple responses

Four hundred and sixty-nine (87.7%) guardians had treated febrile children at home with drugs before presentation at the GOP clinic. Fifty one (9.5%) respondents mentioned that they did nothing prior to coming to the clinic while 5 (0.9%) gave herbs. Other steps taken include tepid sponging, "took child to the chemist/nurse" and "covered child with blanket" mentioned by 4 (0.8%), 2(0.4%) and 1 (0.2%) respondents respectively. The commonest drug used to treat the febrile children at home was paracetamol, mentioned by 380 (81.0%) followed by chloroquine, by 171 (36.5%) respondents (Table 4).

Table 4: Drugs given at home to febrile children before presentation at the GOP (N=469)

Drugs	Frequency	%
Paracetamol	380	81.0
Antimalarial		
<i>Chloroquine</i>	171	36.5
<i>Fansidar</i>	5	1.5
<i>Halfan</i>	1	0.2
Vitamins	150	32.0
Cough syrups	51	10.9
Phenergan/Piriton	18	3.8
Other Analgesics (dipyronc.NSAIDs)	11	2.4
Other Drugs	17	3.6

Note: There were multiple responses

The commonest source of these drugs was the chemists/patent medicine shops, followed by pharmacy stores, mentioned by 443 (94.5%) and 22 (4.7%) respondents respectively. One (0.2%) respondent got the drug from a nurse, one (0.2%) used the left over from drug given at a hospital on a previous visit and 2 (0.4%) got from a neighbour.

Seventy (13.1%) of the respondents had sought help somewhere else before visiting the GOP clinic. 37 (52.9%) went to private hospitals, 25 (35.7%) government hospitals, 3 (4.3%) mission hospitals and chemist respectively and 2 (2.9%) visited a nurse in the neighbourhood. The febrile children were taken to these places on the average (SD) of 3 (1) days after onset of fever.

The presumptive diagnoses of the febrile illness by respondents are shown in Table 5. Malaria ("Iba") was

Table 5: The presumed diagnosis for the febrile illness in the children (N=535).

Diagnosis	Frequency	%
<i>Accompany persons</i>		
Malaria ("Iba")	217	40.6
Teething	27	5.0
Measles	14	2.6
Pneumonia/cough	11	2.1
Typhoid Fever	5	0.9
Others	14	2.6
Don't know	247	46.2
<i>Physicians</i>		
Malaria	229	42.8
Malaria + URTI	74	13.8
Malaria + other illnesses	12	2.2
URTI	58	10.8
LRTI (Bronchopneumonia, bronchiolitis)	28	5.2
Ear/nose/throat infections	21	3.9
Other viral infections	15	2.8
Measles	14	2.6
Impetigo	13	2.4
Enteritis	9	1.7
Others	29	5.4
No diagnosis recorded	33	6.2

the most mentioned. 247 (46.2%) of the respondents did not know what the febrile illness in their children could be due to: 84 (38.7%) of those who presumed illness to be malaria mentioned that the illness was severe. 158 (49.7%) out of those who did not presume the febrile illness to be malaria were of the opinion that the symptoms the children had could have been caused by malaria. Significantly, children who were less than three years of age constituted the larger proportion of those presumed to have diseases other than malaria; notably respiratory tract infection ($P=0.000$)

Correctness of treatment of febrile illness at home using chloroquine

Only 26 of 171 (15.2%) respondents who gave chloroquine to treat febrile illness at home used it correctly according to dose and duration of therapy. Fifty-seven out of the 145 (39.3%) respondents that did not use chloroquine correctly used under-dose of chloroquine, 53 (36.6%) overdose and 35 (24.1%) gave adequate quantity overall but in incorrect frequency and duration of therapy. Significantly, those with post secondary education and in the age group 31-40 years constituted the highest proportions of those that administered chloroquine correctly at home ($P=0.01$ and $P=0.046$ respectively). Chloroquine was commenced within 24 hours of guardian noticing fever in 112 out of 153 children (73.2%), between 24-48 hours in 24 (15.7%) and >48 hours in 17 (11.2%) children with a mean (SD) 1.5 (1.2) days, mode of 1 day and range of 1-10 days.

Only 25 of 80 (31.3%) respondents who used antibiotics to treat febrile illness used it correctly in terms of dose and frequency of administration. Forty-eight (60.0%) used Cotrimoxazole (Septrin*), 17 (21.3%) ampicillin/ampiclox/amoxycillin, 4 (5.0%) tetracycline while 2 (2.5%) used chloramphenicol and erythromycin respectively. Twenty-two of 48 (45.8%) respondents who used Septrin* use it to treat presumed malaria. No significant difference was observed in the correctness of use of antibiotics or otherwise by age group or level of education ($P=0.32$).

Knowledge on malaria.

Three hundred and seventy-nine (70.8%) respondents correctly mentioned "mosquito bite" as the cause of malaria. 129 (24.1%) mentioned "exposure to too much sun", 22 (4.1%) water puddles and 12 (2.2%) hard work. The other causes mentioned include "dirty environment", "change in weather", "bad water", "witchcraft" and "eating too much palm oil" mentioned by 8 (1.5%), 7 (1.3%), 6 (1.1%) and 2 (0.4%) respondents respectively. Some of the symptoms and signs respondents associated with severe malaria are shown in Table 6. The malaria prevention measures known and practised by guardians are shown in Table 7. The most mentioned as known and used was the insecticide spray and incense. There was no statistically significant difference in the knowledge of cause of malaria and the preventive measures by level of education and age group ($P=0.64$ and $P=0.86$ respectively)

Clinical findings.

The mean (SD) temperature of 466 febrile children that had their temperature measured was 37.5°C (1.1°C) with a range of 35.0°C-40.0°C. One hundred and ninety-seven (42.3%) had axillary temperature of =37.5°C-39.9°C, 9 (1.9%) had hyperthermia (=40.0°C) and 260 (55.8%) were afebrile (=37.4°C). The physicians' diagnosis of the febrile illness is shown in Table 5. 52 (9.7%) of the febrile children were referred; 42 were referred to the children's emergency ward for admission and 6 to otorhinolaryngology clinic. These

consisted of 24 (46.2%) cases of severe bronchopneumonia, 6 (11.5%) malaria complicated with severe anaemia, 9 (17.3%) sickle cell anaemia children with severe anaemia precipitated by malaria, 3 (5.8%) measles, 3 (5.8%) septicaemia and a case (1.9%) of meningitis referred to children's emergency ward as well as the 2 (3.8%) cases of acute tonsillitis and 4 (7.7%) cases of suppurative otitis media referred to the otorhinolarygologist.

Table 6: Signs and symptoms of severe malaria mentioned by respondents. (N=535)

Signs and Symptoms	Frequency	%
Very High Fever	274	51.2
Convulsion	187	35.0
Anaemia	76	14.2
Yellow eyes	67	12.5
Persistent Fever	63	11.8
Anorexia	43	8.0
Coca Cola coloured Urine	38	7.1
Rigors and chills	31	5.8
Diarrhoea	29	5.4
Fast Breathing	19	3.6

Note: There were multiple responses

Table 7: Frequency distribution of prevention measures known and practised by respondents (N=535).

Prevention measures	Known		Practised	
	Freq	%	Freq	%
- Insecticide (spray, coil)	267	49.9	229	42.8
- Mosquito Nets	220	41.1	141	26.4
- Chemoprophylaxis with drugs	178	33.3	56	10.5
- Mosquito repellents	94	17.6	15	2.8
- Prevent water puddles	93	17.4	45	8.4
- Child should avoid exposure to too much sun	78	14.6	39	7.3
- Good hygiene/clean environment	27	5.1	54	10.1

Note: There were multiple responses

Laboratory findings

One hundred and ninety-nine (41.8%) of 476 children that had thick blood film smears done had patent parasitaemia. When this was cross tabulated with physicians' presumed diagnosis, the physicians correctly diagnosed malaria in 172 out of 298 (57.7%) children presumed to have malaria and/or malaria with other co-morbidity (sensitivity). 137 of 158 (86.7%) children that were presumed to have other diseases had negative smears (specificity). The ability of the attending physician to diagnose malaria correctly was

significant ($P=0.000$). The guardians' presumed diagnosis was also cross tabulated with the laboratory diagnosis and 88 of 191 presumed cases of malaria were smear positive, a sensitivity of 46.1% and 40 of 62 cases that were presumed not to be malaria were smear negative, specificity of 64.5%. This was not statistically significant ($P=0.19$).

Discussion

This study reiterates the fact that majority of childhood febrile illnesses are first treated at home and that help is sought thereafter if the illness becomes serious, or fails to respond to initial treatment or complications set in. The study also shows that majority of febrile illnesses are presumed to be due to malaria and are treated as such in the first instance. This is not surprising as malaria is endemic in the study area.

Urban malaria in West Africa is not well documented [14]. Very little has been done on home management of malaria (HMM) interventions in urban communities in Nigeria where drugs including pre-packaged chloroquine and newer drugs for malaria are relatively readily available and are used indiscriminately. The focus of studies on HMM strategy in rural areas was informed by the poor knowledge of caregivers regarding malaria, its management and poor availability of health care facilities in these location. However, previous studies carried out on urban malaria in Nigeria and Uganda showed that there is equally poor knowledge and practice of correct use of antimalarial drugs in urban communities as it is in the rural communities [15, 16, 17]. Similar to reports from past studies [5] many caregivers in this study commenced drug treatment at home within 24 hours of onset of fever thus, putting them in a vantage position to provide prompt and early treatment to febrile children. However, the proportion that used chloroquine (the drug of choice for the treatment of malaria in Nigeria at the time this study was done) correctly in this study is as poor as reported in related past studies in this country and in some other malaria endemic countries in sub-Saharan Africa [7, 6, 5, 2, 18]. This underscores the need to provide intervention to urban dwellers to ensure effective home management of childhood malaria.

Very little has been done to study the use of antibacterial agents in the home management of febrile children in this environment. This study, like that reported by Salako *et al.* (2001b), showed that caregivers are to some extent able to identify symptoms that require use of antibacterial agents rather than antimalarial drugs. However, just like the use of antimalaria drugs the use of antibiotics was mostly incorrect in terms of dose for age as well as frequency of administration. This constitutes an area of future research. The goal of such research could be to dissuade mothers from using antibacterial agents at home without prior prescription by a health professional or to look into the possibility of extending the home management strategy concept to include the use of antibacterial

agents to treat suspected childhood bacteria infections as previously advocated by WHO and others [19,20,21]. However, the possible implications for delay in presentation at health facilities and the consequent impact on high morbidity and mortality needs to be critically considered.

The use of antipyretic drugs was found to be high and appropriate. This practice stands to reduce the occurrence of febrile convulsion in febrile illnesses [22]. The use of antimalarial drugs for many of the children suggests that the caregivers complied with the World Health Organisation's (WHO) recommendation [3].

The better knowledge of the causation of malaria and the preventive measures reported in this study compared to that reported from studies conducted in rural areas is worth mentioning although not surprising. The rural-urban differences likely reflect difference in educational level, access to health information and health care services which are better in the urban area [23].

The accuracy of diagnosing malaria by caregivers was below average in this study. This suggests some limitation in their ability to recognise symptoms adequately [10] and to practice home management of malaria effectively. This constitutes an important area of need that requires attention. One limitation of the finding in this study and which calls for caution in its interpretation is the fact that some of the febrile children have received antimalarial drugs prior to presentation and the laboratory test in the clinic. This could have made some caregivers not to have mentioned malaria as the diagnosis because they would have expected the antimalarial drugs given to have cured the children not mindful of the fact that some of these drugs may not be of good quality and infective strains of malaria parasite may be resistant to chloroquine. Another confounder is the presence of chloroquine resistant malaria in the community. In addition, a child suffering from malaria may present with a negative slide, this is more frequent after the start of treatment [19].

Several clinical studies have highlighted the difficulties in distinguishing malaria and pneumonia in children with cough, fever and fast breathing in Africa, where both conditions are common and are frequent causes of childhood deaths [19,24]. Consequently, effective antimalaria therapy is often required in febrile children with suspected pneumonia [19]. This is reflected in the physicians presumed diagnosis and the fact that some of the children diagnosed to have respiratory tract infections had patent parasitaemia. In this study, febrile children, 3 years and below constituted a large proportion of those presumed to have other diseases especially respiratory tract infection. This corroborates statements by WHO and others that infectious diseases of the respiratory tract are a major cause of morbidity and mortality in children under 5 years worldwide [25,26].

The knowledge of preventive measures for malaria is fair. However, the use of bed nets is still low in this environment despite the effort of the Roll Back Malaria

Initiative to promote the use. However, it was not ascertained in this study whether the bed nets reported used were treated and if they were put to use all the time.

This study has been able to highlight the caregivers' practice of pre-hospital treatment of fevers in an urban setting. There is a need to provide education and guidelines on the early recognition of signs and symptoms of malaria to aid diagnosis and correct treatment of malaria among these urban dwellers. The study also confirms that parents have a key role to play in the management of childhood febrile illnesses and potential to correctly manage febrile illness at home as well as consult health facilities when necessary. Considering the significant proportions of caregivers who gave febrile children antibacterial agents based on the presumed diagnosis of non-malarial febrile illnesses, further research into the appropriateness of home treatment of febrile illness using antibacterial agents when indicated is suggested.

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