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Malaria infection in children in tropical rainforest: assessments by women of Ugbowo Community in Benin City, Nigeria

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ABSTRACT

Objective: To examine how mothers recognize malaria infection in children aged less than five and five years, frequency and duration of the infection in these children as well as measures used to reduce exposure of children to mosquito bites, and to discuss the possibilities of designing a strategy that involves mothers in management and control of malaria infection.

Methods: The data were originated from personal interviews which involved mothers in the Ugbowo Community in Benin City, Nigeria who were selected using multi-stage systemic random sampling technique. The data were analyzed qualitatively and by use of percentages, arithmetic mean and bar chart.

Results: The results showed that all the interviewees believed that children got malaria infection along with fever or fever and other symptoms. Approximately 30% of interviewee recognized malaria infection through fever and cough while 1% by fever and vomiting. Approximately 72% of the interviewees claimed that their children had malaria infection every three months and 16% claimed that their children had the infection every month. Most of the interviewees reported that the length of time from recognition of malaria symptoms on their children to treatment was between one and three days. Most of the interviewees used insecticide treated bed nets to reduce their children's exposure to mosquito bites and few used mosquito repellent ointment.

Conclusions: For malaria management strategy to be effective and sustainable, it is important to empower women with more knowledge on detection of malaria symptoms and they should be involved in planning and designing the strategy.

1. Introduction

Malaria infection is caused by a protozoan parasite of the genus *Plasmodium*. The species known as *Plasmodium falciparum* is the most common cause of malaria infection[1]. Malaria kills many young children in sub-Saharan Africa[2]. The disease leads to numerous complications in children such as anaemia, pulmonary oedema, renal failure, hepatic dysfunction and coma[3,4]. Some of the symptoms of malaria infection are fever, vomiting, sweats, chills, cough and fatigue. Although governments of most sub-Saharan African countries and international community

have continued to invest in prevention and management of malaria, the disease has remained a major public health problem in Africa[5,6]. For example, about 90% of all deaths related to malaria occurred in sub-Saharan Africa and most affected individuals were children[7]. Malaria has been one of the main causes of death among children in Ethiopia[8]. Several malaria related deaths occurred in Burkina Faso each year[9]. Malaria has been the main cause of deaths in Nigeria especially in children[10–12]. In order to reduce malaria related incidence, several malaria control strategies have been developed such as prompt access to diagnostic testing using rapid diagnostic tests[13], home-based management of malaria[14], and use of insecticide treated bed nets and indoor insecticide sprays[15,16]. However, in order to let the control strategies be effective, locally acceptable and sustainable, it requires a multi-intervention approach which involves participation of all

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relevant stakeholders^[17]. In recognition of the importance of stakeholders' participation in the control and management of malaria, health managers have adopted the so called "community-based management of malaria" which aimed at involving local communities in management of malaria^[18]. For the effectiveness of "community-based management of malaria", it is important to have knowledge of local community's perceptions of malaria and how to integrate their perceptions into management and control of malaria. Community's perceptions and attitudes are important in management of malaria because they influence the recognition of symptoms and the use of health services^[19].

In the literature there are several studies that have focused on community's perceptions of malaria. For example, households' knowledge of malaria^[20,21], recognition of malaria related symptoms by households^[22], and awareness that mosquito bites has been the main route for transmission of malaria parasites^[15,23]. The frequency of malaria infection is important in ascertaining the intensity of the infection in a community. However to the best of our knowledge there is no previously published paper that has focused on frequency of malaria infection in children. This paper contributes to the literature on community's perceptions of malaria infection in sub-Saharan Africa as well as provides more understanding on the frequency of malaria infection. Although effective treatment for malaria infection is available, the disease still remains one of the main causes of sickness and deaths in children in sub-Saharan Africa^[24-26]. In some cases management and treatment of malaria infection in children are taken by parent or next of kin at home but their inability to correctly recognize symptoms related to malaria have led to death of the sick child^[27,28]. The effective management and control of malaria infection will require the involvement of individuals, and local community which often bear the burden of the disease and have some experience on issues related to the infection. Since Africa mothers are often the caregivers especially on childhood ailments^[11], it is important to expand women's knowledge to correctly recognize malaria infection in children. This is important due to in most African countries especially in rural areas the nearest health centre is often far away from home. This suggests that correct recognition of malaria infection in children by mothers could help in giving the sick child an appropriate first aid treatment before taking him or her to the health centre. Malaria infection is endemic in the tropical rainforest. People often use different techniques to protect themselves against mosquito bites. These include sleeping in mosquito nets, use of insecticide spray^[15,16,29], wearing clothes that could cover most parts of the body especially in

the evenings, and emptying kerosene into stagnant water to help prevent breeding of mosquito by suffocating mosquito larvae as well as getting rid of water in drainage systems. The duration of malaria infection from recognition by mother to treatment will depend on the mother's ability to correctly identify the symptoms on time, the type of malaria parasite and the immune status of their children^[30]. Thus it is important for mothers to be able to recognize the early symptoms of malaria infection to help reduce the death rate.

Although in most sub-Saharan African countries the strategy for reducing malaria infection has focused on provision of effective and affordable health care, it has not been very effective. It could be the reason that local communities are rarely involved in designing and implementing malaria control strategy and local contexts, cultural changes and community perceptions are not often considered^[31]. Moreover, lack of convergence of local and bio-medical perceptions of malaria contribute to high morbidity and mortality rates in sub-Saharan Africa^[32]. Thus it is important to better understand regarding caregivers' perceptions of malaria and strategy that could help strengthen management of malaria at the community^[33]. The aim of this paper was to explore symptoms that mothers' uses to recognize malaria infection in children aged less than five and five years. It also explores occurrence and duration of the infection among these children as well as measures taken by mothers to reduce their children's exposures to mosquito bites. The possibilities of designing a strategy that involves mothers in management and control of malaria infection are discussed.

The study reported in this paper involves women of Ugbowo Community in Benin City, Nigeria. It is hoped that the findings will provide women the indigenous knowledge of malaria infection and how to incorporate this in designing an effective and sustainable management of malaria infection. This paper focused on women, for their important roles as primary caregivers at home^[31].

2. Materials and methods

2.1. The study area

This study was carried out in Ugbowo located in Egor Local Government Area of Edo State, Nigeria. The study area has a tropical climate and has two distinct seasons, *i.e.* the wet season and the dry season. The wet season lasts for approximately eight months (April to November) and the dry season lasts four months (December to March).

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