Full Length Research Paper

Seasonal prevalence of malaria parasites infection in Maiduguri, Borno State, North East, Nigeria

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This research study was undertaken to determine the prevalence, monthly distribution of malaria, and Prevalence of Plasmodium species in Maiduguri Nigeria in order to generate baseline information. Blood samples were collected from patients attending UMTH for period of four years. Thick and thin blood films were Giemsa stained and observed for the presence of malaria parasites. The gender-specific infection rate showed that females had the higher infection rate of than male in 2012. Similar trend was also observed in 2013, 2014 and 2015. In time of prevalence. A total of 1346 in 2012 were examine, 1164 were infected, in 2013 1294 were examined 9884 were infected, in 2014 641 subject were examine, 544 were infected likewise 2015 922 subject were examine 718 were infected. In 2012 and 2013 highest prevalence rate being recorded in the month of October positive. In 2014 highest prevalence was recorded in month of August .In 2015 highest prevalence rate was recorded in month of September. Infection rate according to age showed that in 2012-205 subject within age group from 31-40 suffer high rate of infection.. The study has revealed the presence of malaria transmission throughout the year in Maiduguri, Borno state and the infection rate can be considered as moderately high.

Key words: Prevalence, Malaria, Plasmodium, Infection.

INTRODUCTION

Human Malaria is a tropical protozoan disease caused by plasmodium species which are transmitted by the bite of the female mosquito of the genus Anopheles. Malaria is the most important of all the tropical diseases in terms of morbidity and mortality as it is so deadly that it can kill within hours (World Health Organization, 2005).

In sub-Saharan Africa malaria is the second highest disease burden besides AIDs (WHO, 2000). It is endemic in 50 countries with the greatest number of cases occurring in Nigeria, Democratic Republic of Congo, Tanzania and Ethiopia (WHO, 2005). In Nigeria, malaria is endemic throughout the country with up to 90% of the population living in areas with stable malaria with a national prevalence rate of 2.0%. Malaria alone accounts for 60% of outpatient visits in hospital and 15-31% of admissions (Federal Ministry of Health, National malaria control program, 2005).

In Nigeria, malaria is endemic and stable, being a major cause of morbidity and mortality, resulting in 25% infant and 30% childhood mortality (FMH, 2005a). It was ranked as the highest cause of death in 1978 and 1982 (Osisanya, 1985). Tragically, the health status of children under the age of five and women has remained a major barrier to Nigeria’s development. It is estimated that about 100 children under one year and 203 children under-five years out of 1000, respectively, die annually (NDHS, 2003). In other words, one out of every five Nigerian children dies before his/ her fifth birthday (RBM, 2000). Among pregnant women, malaria is responsible for more than one in 10 deaths and accounts for considerable proportion of low birth weight babies born to these mothers. Malaria is endemic throughout Nigeria with seasonal variation in different geographic zones of the country. More than 90% of the total population is at risk of malaria and at least 50% of the population suffers from at least one episode of malaria each year.

Epidemiological patterns of malaria are widely different from one place to another in Maiduguri as stated by

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Specific data of a place collected can help in the making of a tailor-made design of improved programme for strategic malaria control for a particular location that why the study seek to unveil the prevalence of malaria in UMTH Maiduguri.

Objective of Study

The overall objective of the study was to assess the prevalence of malaria parasite among patient attending UMTH Maiduguri.

MATERIALS AND METHODS

Study area and the population

Maiduguri is the Capital of Borno State, the state lies approximately between latitude 10° 2’N and 13° 4N and longitude 9° 8 E and 14° 4'E, while Maiduguri Lies on latitude 11° 40’N and 13° 5E longitude. The state occupies the greater part of the Chad basin and is in the North eastern part of Nigeria, the state share borders with the republic of Niger to the North, Chad to the North east and Cameroon to the East. Within Nigeria, the state shares boundaries with Adamawa state to the south, Gombe state to the west and Yobe state to the North West. It is located in the Sahel Savanna region of north-east Nigeria. The climate of Maiduguri is favorable, with a mean annual rainfall and temperature of about 650 mm and 32°C respectively. The month of March and April are the hottest periods of the year with temperatures ranging between 30°C and 40°C. It is usually cold and dry during the Harmattan, November to January being the coldest months. (Borno State Ministry of Information. 2015).

Preparation of thin Blood Film

The thin blood film was made as follows; a drop of blood was put at one end of a well cleaned and grease-free slide, and a spreader was used to produce a uniform spread of the blood over the slide such that a feathery tail end was achieved. The slide was then kept at a dry surface to air dry after which it was fixed with alcohol (95%) or with May Grunward fixative. The fixed slides were then stained with Giemsa stain made from a concentrated stock solution as follow; 3 drops of the stain to 2 ml of distilled water and allowed for a staining duration of 8 to 10 minutes after which it was washed, air dried and observed using the x100 oil immersion objective Duguid et al 1978. When the thin blood films were examined, the following were seen: RBCs and WBCs.

Preparation of thick Blood Film

Unlike the thin blood films, the thick blood films were made just by spreading a drop of blood at the centre of a clean grease-free slide in order to defibrinize the blood. It was allowed to air dry after which it was stained with the Giemsa stain for 8 to 10 minutes without fixing with alcohol or may gunwale fixative Duguid et al 1978. When the thick blood film was examined, using the x100 objective and the x7 ocular, the following were seen: remains of red blood cells; white blood cells (Leukocytes) and platelets (thrombocytes). The thick blood film consisted of many dehaemoglobinized red blood cells packed together in a thick mass since after staining with the Giemsa stain, the water in the stain acted on unpreserved red blood cells that caused the contents of the cells to dissolve in the water; hence dehaemoglobinization.

Examination of Blood Films for Malaria Parasite Recognition

Malaria parasites were found to take up Giemsa stain in a special way in both the thick and thin blood films. Since the malaria parasites are known to pass through a number of developmental stages; in all the stages however, the same parts of the parasite were stained with the same colour: chromatin (part of the parasite nucleus) that is usually round in shape was stain deep red. The cytoplasm was presented in a number of forms; from a ring shape to a totally irregular shape. It was noticed to stain blue, although the shade of the blue could vary among the malaria species.

Data collection

Blood samples were collected by, from patients attending University of Maiduguri Teaching Hospital Microbiology Department. Thick and thin blood films were stained with a 3% Giemsa solution for 45 min according Cheese brough, (2006) and observed according to the procedure of Hanscheid (1999); the number of asexual parasites per 200 white blood cells (WBCs) was counted and parasite densities were computed assuming a mean WBC count of 8,000/ _l. A slide was defined as negative if no asexual forms were found after counting 1,000 WBCs. Thin films were used for the species identification of Plasmodium parasites.

Data analysis

Data generated was analysed SPSS version 19 and differences were considered significant at P value ≤ 0.05,
Table 1: Malaria prevalence in Maiduguri Metropolis according to age, between 2012-2015.

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Sex
- Male: 380, 344, 189, 265, 311, 300, 164, 248
- Female: 404, 363, 208, 280, 333, 32, 180, 268

RESULTS AND DISCUSSION
The gender-specific infection rate showed that females had the higher infection rate of plasmodium falciparum than males. In time of prevalence, a total of 404 in 2012 were examine, 333 were infected, in 2013 363 were examined 32 were infected, in 2014 208 subject were examine, 180 were infected likewise 2015 280 subject were examine 260. (Table 1). The study according to age showed that the prevalence of plasmodium species from age group 0 – 10 year to 50 > years was significant (Table 1). The results of the prevalence rate were recorded in months of October followed by month of August. In 2012 September had highest rate of prevalence while least was recorded in months of March. Similar trend was observed in 2014. In 2015 highest rate of infection was recorded in month of July and October. The higher prevalence rate among women in Maiduguri
could just be by chance, or due to the fact that females engage in activities which make them more prone to infective mosquito bites as compared to their male counterparts that are mostly at home and protected from such infective bites, this further buttressed such claims made by World Health Survey, 2006. The higher prevalence of malaria among children age group 0-10 and >50 years seen in this study is in line with several studies (WHO, 2005b; Umar and Hassan, 2001).

**REFERENCE**

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