



## **SLIDE POSITIVITY RATE OF MALARIA AMONG PATIENTS ATTENDING TWO HOSPITALS IN KANO METROPOLIS**

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### **ABSTRACT**

*Slide positivity rate of malaria among patients attending two hospitals in Kano metropolis was investigated during the wet season using four hundred blood films. A slide positivity rate of 250 (62.5%) was recorded with 117 (64.63) from slides of male patients and 133(60.70%) from slides of female patients, however the difference was not significant ( $p>0.05$ ). blood films from age range of 0-10 recorded highest slide positivity rates 114 (81.0%). The disease burden was found to be high despite the different ongoing malaria campaigns in the state, therefore intensifying the campaign was highly recommended.*

**Key words:** malaria, slide positivity rate, Kano metropolis

### **INTRODUCTION**

Malaria has a worldwide distribution, affecting people of all ages, with an enormous burden amounting to 300-500 million clinical cases per year, 80% of which occur in Africa (Lucas & Gills, 2003). Globally ten (10) new cases of malaria occur every second, which is a major public health problem in the tropics where about 40% of the world population lives. Malaria is responsible for more than a million deaths each year, 90% of which occur in sub-Saharan Africa (Park, 2002).

At least 3000 people die from malaria everyday, as a result of lack of access to insecticide treated bed nets, health care and drugs. Malaria is a leading cause of mortality in under five accounting for 20% of death and constitutes 10% of the total disease burden of African continent (Kabore, 2001). In Nigeria, malaria is one of the four most common causes of childhood mortality with 50% of the population having at least one episode of malaria each year, which the under five children have up to 2 – 4 attacks annually (FMOH 2005).

The economic impact of malaria is enormous especially in African countries with lean resources. The direct and indirect costs of malaria in Africa exceed US \$2 billion a year, while economic loss was estimated to be US \$12 billion in 2004 (Kabore, 2001). The disease also affect the socio-economic and development of the poor countries, population studies have shown that in Kenya, 11% of primary school days are lost to malaria. The disease also causes losses of 26% of the nations Gross Domestic Production (GDP). In Nigeria 1 – 5% of the country's GDP is lost due to malaria (TDR, 2000). The financial loss due to malaria in Nigeria annually estimated to be about 132 billion Naira in form of treatment cost, prevention and loss of man-hours. (FMOH, 2005).

Malaria is a disease that ranks numbers one on the WHO most serious topical diseases (Dobson, 1999; Nejara, 2002). The diseases is responsible for 60% of out patients visit to health facilities, 30% of childhood mortality and 11% of maternal deaths(FMOH,2005). Therefore the study was carried to assess the slide positive rate of malaria among patients attending two major hospital in Kano metropolis.

### **MATERIALS AND METHODS**

#### **Study Area**

The research was conducted in Kano Metropolis. Kano falls within latitude 20° North and 12° 30' South of the equator. The population was 2163225 as at 2006 population census, with 964889 males and 1198336 females.(NPC, 2007). Kano is within the savannah region of Nigeria, rainy season is usually from the months of May to October and the cold and dry season is within the months of November to April. Malaria is meso to hyper-endemic in the whole state and it is seasonally transmitted, with the main peak of transmission from early June to Late August and second/minor peak from early October to mid November. These transmission periods corresponds to the rainy and dry season when the mosquito population is high (WHO, 1992). Two hospitals were selected, these were Abdullahi Wase Specialist Hospital Nassarawa Kano and Murtala Muhammad General Hospital Kano, were selected for the study.

#### **Study Design**

Four hundred (400) samples of Blood were randomly collected at the two hospitals from patients who visit the laboratory for routine laboratory test and screened for malaria parasite (Mp).

**Blood sample Collection**

The samples were collected during the rainy season, they were obtained as fresh whole blood by either finger puncture or as whole blood containing EDTA, that was collected by venipuncture.

**Preparation of blood film (thick and thin)**

Two (2) drops of the blood were placed on both ends of a grease free slide (i.e. one drop on each side). The edge of another slide was placed barely in contact with one of the drops at an angle of 30<sup>o</sup> – 40<sup>o</sup>. The blood was then spread along the edge of contact, then with a swift motion, the spreader was moved forward and film of blood was left behind as shown by (Decei and Lewis 1995). The edge of the slide was also used to increase the diameter of the other drop, to an area of about 15mm in diameter. The slide was then air-dried in dust free area, especially the thick film.

**Staining procedure**

The air-dried film was fixed by dipping in absolute methanol; care was taken so that the alcohol or its fumes do not touch the thick film. The slide was then allowed to thoroughly dry in a vertical position with the thick film upward. After drying the film, Giemsa Stain (1:50) was flooded over the entire slide and

allowed to stand for 50 min. The slide was then transferred into dilution solution (2ml of Giemsa to 40ml of buffered water). The thick film was placed downward to prevent debris caused by dehemoglobinization from falling on to the thin film. The thick film was then immersed in buffered water to wash for 3-5 min; the buffered water was not allowed to touch the thin film. After washing, the slide was air dried in a vertical position with the thick film downward as described by (Lewis, 2001).

**Microscopic examination**

Microscope was used to examine was dine after adding a drop of oil immersion on each of the films. Thin film was first viewed under x 40 objective before x 100 objectives while the thick film was viewed under x 100 objectives alone (Ukoli, 1984).

**Data analysis**

The data obtained were presented in percentages; and subjected to analysis of variance to determine if there are significant differences between them.

**RESULTS**

Out of the four hundred samples examined for malaria parasite (MP) 250 (62.5%) were found to be positive. The result are showed on Tables 1 - 3

**Table 1: Overall malaria distribution in relation to sex.**

| Sex          | No. screened | No. Positive | % positive  |
|--------------|--------------|--------------|-------------|
| Males        | 181          | 117          | 64.6        |
| Females      | 219          | 133          | 60.7        |
| <b>Total</b> | <b>400</b>   | <b>250</b>   | <b>62.5</b> |

Males were found to be more infected 117 (64.6%) than females 133 (60.7%).

**Table 2: Distribution of positive slide in relation to sex in the two hospitals**

| Sex            | Murtala      |              |            | Abdullahi Wasre |              |            |
|----------------|--------------|--------------|------------|-----------------|--------------|------------|
|                | No. screened | No. positive | % positive | No. screened    | No. positive | % positive |
| <b>Males</b>   | 94           | 60           | 63.8       | 87              | 54           | 62.06      |
| <b>Females</b> | 106          | 71           | 66.98      | 113             | 65           | 57.5       |
| <b>Total</b>   | 200          | 131          | 65.5       | 200             | 119          | 59.5       |

The slide positivity of both males 60 (63.8%) and females 71 (66.9%) was higher among patient from Murtala specialist hospital when compared to those from Abdulahi Wase hospital with 54 (62.15%) males and 65 (57.5%) females.

**Table 3: Distribution of positive slides by age in the two hospitals**

| Age            | Murtala Splst Hsp |              |            | Abdullahi Wase Splst Hspt |              |           | % Overall positive |
|----------------|-------------------|--------------|------------|---------------------------|--------------|-----------|--------------------|
|                | No Screened       | No. positive | % positive | No. screened              | No. positive | %positive |                    |
| <b>0-10</b>    | 68                | 56           | 82         | 72                        | 58           | 81        | 81                 |
| <b>11-20</b>   | 29                | 14           | 48         | 32                        | 22           | 69        | 58                 |
| <b>21-30</b>   | 31                | 20           | 65         | 17                        | 6            | 35        | 54                 |
| <b>31-40</b>   | 38                | 20           | 53         | 40                        | 17           | 43        | 47                 |
| <b>41-50</b>   | 17                | 11           | 64         | 20                        | 6            | 30        | 45                 |
| <b>&gt; 50</b> | 17                | 10           | 59         | 19                        | 10           | 53        | 55                 |
| <b>Total</b>   | <b>200</b>        | <b>131</b>   | <b>66</b>  | <b>200</b>                | <b>119</b>   | <b>59</b> | <b>63</b>          |

In both hospital highest slide positivity was recorded among 0-10 age range 56 (82%) and 58 (81%). The least slide positivity result from Murtala hospital was within age range of 11-20 with 14 (48%) positivity

while age range of 41-50 was the least slide positivity 6(30%) from Abdullahi Wase hospital.

## **DISCUSSION**

Out of the 400 samples screened for malaria parasite 250 (62.5%) were positive with malaria parasite, this suggest hyperendemicity as described by (WHO, 1992). The highest slide positivity rate (81.0%) was recorded within the age group of 0-10 suggest a high rate of malaria infection among children of this age group. This may be attributed to low transferred maternal immunity or infection acquired through the mother or due to inadequate protection (Ukpai and Ajoku, 2002). More positive Mp slide were found among males (64.6%) than females (60.4%), this is in line with the findings of Mandel and white (1984) who showed a high malaria complication and density of parasitaemia in the blood of males than unpregnant females. Ukpai and Ajaku (2002) suggest that males

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are more exposed than females due to nature of their jobs which exposed them to mosquito bite. Apart from exposure, stress (physically and mentally), may be the predisposing factor.

## **CONCLUSION**

The high slide positivity rate of malaria parasite, suggest a high prevalence of malaria among patients attending the two hospitals this could be attributed to high endemicity of Kano during the wet season with a high insulating climatic condition and several water bodies favorable for mosquito breeding and high malaria transmission all year round (WHO,1992) ( FMOH, 2005). Therefore enlightenment campaign should be intensified and socio-economic status of the people improved.