
PREVALENCE AND RISK FACTORS ASSOCIATED WITH MALARIA INFECTION AMONG PRE-SCHOOL CHILDREN OF BAKASI IDP CAMP IN MAIDUGURI, BORNO STATE

¹A.A.G Benisheikh, ²Falmata Kyari ³Fatima Lawan Bukar ⁴Hajara I. Mustapha ⁵Fatimah Maina Muhammad ⁶Dahiru A.S ⁷Hafsat Ngabra ⁸Amagai Daniel

¹North- East Zonal Biotechnology Centre of Excellence, University of Maiduguri/ University of Wolverhampton, United Kingdom

²Department of Veterinary Parasitology and Entomology, University of Maiduguri

³Department of Community Medicine, University of Maiduguri Teaching Hospital, Maiduguri

⁴Mohamet Lawan College of Agriculture, Maiduguri, Borno State

⁵Dept of Biological Science, Faculty of Sciences, Borno State University, Maiduguri

⁶Dept. of Integrated Science, School of Science Education, Federal College of Education (Technical) Gombe

⁷Centre for Biotechnology, University of Maiduguri (M.Sc. Biotechnology programme)

⁸Dept. of Microbiology, Faculty of Sciences, University of Maiduguri

Email: abbaganabenisheikhali@gmail.com

ABSTRACT

Malaria is a life-threatening parasitic infections caused by the protozoan parasite in Sub-Saharan Africa with high morbidity and mortality in children. The protozoan parasite are transmitted to its host through a female anopheles mosquito bite. The overall prevalence rate of malaria infection among pre-school children in Bakasi IDP camps revealed that, out of 100 pre-school children examined 52.0% were infected with malaria parasite. Besides, 56.9% were male and 45.2% were female. Likewise, prevalence rate of 44(44.0%) were recorded based on age group of subjects examined with highest prevalence rate of 32(64.0%) in ages group of 0-2 years, followed by 4 (27.0%) in 2-4 years and 4 (23.0%) in 4-6 years respectively. Whereas 26(26.0%) prevalence rate were recorded based on educational status of mothers. Out of which 3(30.0%) has secondary education, 7(28.0%) has obtained primary education, 16(24.6%) has none-formal education and 0(0.0%) has tertiary education respectively. 3(9.6%) prevalence rate were recorded based on the socio-economic associated risk factors influencing malaria fever among those using insecticide treated nets (ITNs) while 63 (91.3%) were infected among those subjects that lack insecticide treated nets (ITNs) respectively. 77 (89.5%) of those leaving closer to stagnant water were infected with malaria fever while 3 (21.5%) of those leaving not in the vicinity of stagnant water were infected with malaria fever. 69(88.3%) that staying in a room without windows/doors are infected with malaria fever while 5 (21.7%) of those leaving in a room with window/doors are infected with malaria fever. 39 (95.1%) were infected with malaria fever while 8 (13.6%) were infected with malaria fever among those leaving in a not over crowded room. It is pertinent to note that lack

proper shelter, lower educational status of mothers and none use of insecticide treated nets and socio-economic risk factors are driving forces that predisposes children in the Bakasi IDP camps to malaria infection. Thus, designing of effective and efficient control and prevention measures are paramount for minimise infection rate in the study area.

Keywords: *Malaria infection, Bakasi IDP camp, prevalence, Maiduguri, risk factor, pre-school, children*

INTRODUCTION

Malaria fever is a protozoan disease caused by plasmodium species which transmitted to its host via a female anopheles mosquito bite. Recent literatures indicated that malaria fever is endemic in Nigeria with high incidence in internally displaced camps due overcrowding of the susceptible host and gregarious influx of infected displaced person (Ajayi et al, 2017). According to Ajakeye 2020 larger number of an area affected by insurgency has indicated menace of malaria infection and other neglected tropical diseases due lack proper shelter, inability to purchase insecticide treated nets (ITNS) and poor hygienic conditions. Other malaria fever predisposing factors in the Bakasi internally displaced camps included excessive growths of grasses around and within the vicinity of the camps and the presents of stagnant water during the raining seasons. Thus, the displaced pre-school children appear to be at higher risk for malaria infection due to higher exposure index to the vector (mosquito) at all the time (Owoaje et al, 2016). As reflecting on the global increasing index of internally displaced persons with approximately 40 million people in 2015 due wars and violence attributing from religious and ethnocentric conflicts. In Sub-Saharan Africa where the present studies were conducted Malaria and malnutrition are the major causes of childhood mortality (O'Meara et al, 2010). Due the aftermaths of Boko haram insurgency over 1.4 million IDPs are living in more than 100 camps with different degree of diseases such malaria and typhoid fever (WHO 2013).WHO 2019 reported that each year, malaria kills more than 800 000 people, of which 91% reside in Africa and 85% are children aged below 5 years. Besides, the malaria increases exponentially during the rainy seasons (Guillebaud et al, 2013 and (Langendorf et al, 2014). As reflecting on weekly surveillance reports from IDP camps in Borno state, a total of 42% malaria cases were recorded (Borno state health sector bulletin 2016).Most recent records indicates that over 20 million IDPs with more than half in Sub-Saharan Africa due to natural or man-made disasters (WHO 2020). In the northern part of Nigeria

there is skyrocketed attacks by the Boko haram sects leading to high influx of refugees and internally displaced persons into the camps with over 868,00 to 1.7 million people from 2009 hitherto (Ajakaye, O.G., and Ibukunoluwa, M.R., 2020).

MATERIALS AND METHOD

Study Site

The study was carried out in Bakasi IDP camp in Maiduguri, it is located in Bakasi housing estate, originally built as part of the Borno state housing project. The camp mainly house resident originated from Monguno, Marte, Gwoza, Guzamala, and Nganzai LGAs.

Sample Collection

One hundred blood samples were collected after seeking the consent and acceptance of their parents. Besides questionnaires were administered to the subjects to obtain demographic information. Each eligible child finger was disinfected with 75% alcohol and quick prick on the heel or thumb of the child using a lancet. The blood sample collected were transferred into malaria RDT kit and two dropped of buffer were added to examined for the results within 2-3 minutes for proper documentation.

Table 1. Prevalence of malaria fever among pre-school children in Bakasi IDP camp-based Gender

Gender	No. Examined	No. of positive	Prev. rate (%) examined
Male	58	33	56.9
Female	42	19	45.2
Total	100	52	52

Out of 100 children that were enrolled consisting of 58 male and 42 female, prevalence of malaria fever was 52.0%. This study revealed that malaria parasite infection has high prevalence in male with (56.9%) than in female with (45.2%) as shown in table 1.

Table.2. Prevalence of malaria fever among pre-school children in Bakasi IDP camp based on Age group

Age	No. of pupils Examined	No. of positive examined	Percentage of positive examined
0-2	50	32	64
2-4	15	4	27
4-6	35	8	23
Total	100	44	44

Likewise, a total prevalence rate of 44(44.0%) were recorded based on age group of subjects examined. Besides, it was observed that children between the ages of 0-2 years had the highest infection rate with the prevalence of 32(64.0%) when compared with other age group 2-4 and 4-6 years with lower prevalence of 4(27%) and 8(23.0%) as shown on table 2 above.

Table.3. Prevalence of malaria fever among pre-school children in Bakasi IDP camp based on mother's educational status

Educational status	No. examined	No. subject positive	Percentage (%) of positive examined
None Formal	65	16	24.6
Primary	25	7	28.0
Secondary	10	3	30.0
Tertiary	0	0	0
Total	100	26	26

The prevalence of malaria fever among pre-school children in Bakasi IDP camp based on educational status of mothers revealed that 26(26.0%) total prevalence rate. With a total of 3(30.0%) has secondary education, 7(28.0%) has obtained primary education, 16(24.6%) has none-formal education and 0(0.0%) has tertiary education respectively table 3 above.

Table 4. Socio-economic associated risk factors influencing malaria fever infection among pre-school children in Bakasi IDP camp Maiduguri

Variable	No. Examined	No. of infected	Perc. of infected
ITNS			
Yes	31	3	9.6
No	69	63	91.3
Stagnant water			
Yes	86	77	89.5
No	14	3	21.4
Rooms without doors/windows			
Yes	77	68	88.3
No	23	5	21.7
Overcrowding Room			
Yes			
No	41	39	95.1
	59	8	13.6

The prevalence rate based on the socio-economic associated risk factors influencing malaria fever revealed that, 3 (9.6%) were infected among those using insecticide treated nets (ITNs) while 63 (91.3%) were infected among those subjects that lack insecticide treated nets (ITNs) respectively. Likewise, the results of those leaving in the vicinity of stagnant water revealed that, 77 (89.5%) of those leaving closer to stagnant water were infected with malaria fever while 3 (21.5%) of those leaving not in the vicinity of stagnant water were infected with malaria fever. Similarly, the results room without windows/doors revealed that, 69(88.3%) that staying in a room without windows/doors are infected with malaria fever while 5 (21.7%) of those leaving in a room with window/doors are infected with malaria fever. Likewise, the results of room over crowdedness indicates that, 39 (95.1%) were infected with malaria fever while 8 (13.6%) were infected with malaria fever among those leaving in a not over crowded room as shown in table 4 above.

DISCUSSION

The findings in this research revealed that,high prevalence rate of 52.0% malaria fever in pre-school children in Bakassi IDP camp which is similar with the findings of Ajakaye et al (2019) with prevalence of 55.2% reported among children in IDP camp in Edo State. Moreover Fatima et al., 2019 in their studies revealed that 35.2% in the same Bakasi. Similar attestation was made by Owoaaje et al.,2016 with a higher prevalence rate of 84.8% malaria infection among IDPs.In a similar report by Spencer et al., 2004

revealed that 11% which is lower than this study was found for the prevalence of *p.falcifarum* among resident of an IDP camps in Uganda. Lack proper shelter, lower educational status of mothers and none use of insecticide treated nets and socio-economic risk factors are driving forces that predisposes children in the IDP camps to malaria infection as similarly observed by Bicego GT and Boerma JT., (1993). Since there is dearth and paucity of data on the prevalence of malaria among pre-school children in IDP camps in the study area. The above information on socio-economic risk factors and low educational strata of mothers could be used for refining the children profile for further outlook for the control and preventive measures against malaria infections.

CONCLUSION

This study revealed that socio-economic status, mother's educational strata, use of insecticide treated nets and leaving in a none stagnant water vicinity plays a pivotal role in the in designing control and prevention measures for minimizing malaria infection.

Acknowledgement

We wish to thank the Bakasi camp coordinator for the permission to administer our questionnaires and undertake this research work.

REFERENCE

- Ajakaye, O.G., Ibukunoluwa, M.R., 2020. Prevalence and risk of malaria, anemia and malnutrition among children in IDPs camp in Edo State, Nigeria. *Parasite Epidemiology and Control* 8, e00127.
- Ajaji, M.B., Sani, A.H., Ezeugwu, S.M.C., Afocha, E.E., Adesesan, A.A., 2017. Intestinal parasitic infection and body mass index among school children in Oshodi, Lagos, Nigeria. *Adv. Cytol. Pathol.* 2 (2), 44–49.
- Bicego GT, Boerma JT. Maternal education and child survival: a comparative study of survey data from 17 countries. *Soc Sci Med.* 1993;36:1207–27
- Fatima Lawan Bukar 2 Hadiza Lawan Bukar *3 Ali Abba Gana Benisheikh 4 Umar Baba Mallam 5 Fatima Maina Muhammad 6 Hajara Ibrahim Mustapha Trends in the prevalence of childhood malnutrition and malaria infection among pre-school children in

Internal Displaced Persons (IDPs) Camp Maiduguri, Borno State
Volume 02 | Issue 09 | September 2019 www.ijournal.com

Guillebaud et al. *Malaria Journal* 2013, 12 :379
<http://www.malariajournal.com/content/12/1/379>

Langendorf C, Roederer T, de Pee S, Brown D, Doyon S, et al. (2014) Preventing Acute Malnutrition among Young Children in Crises: A Prospective Intervention Study in Niger. *PLoS Med* 11(9): e1001714. [doi:10.1371/journal.pmed.1001714](https://doi.org/10.1371/journal.pmed.1001714)

O'Meara WP, Mangeni JN, Steketee R, Greenwood B: Changes in the burden of malaria in sub-Saharan Africa. *Lancet Infect Dis* 2010, 10:545–555.

Owoaje ET, Uchendu OC, Ajayi TO, Cadmus EO. A review of the health problems of the internally displaced persons in Africa. *Niger Postgrad Med J.* 2016 Oct-Dec;23(4):161-171. doi: 10.4103/1117-1936.196242. PMID: 28000636.

Owoaje, E.T., Uchendu, O.C., Ajayi, T.O., Cadmus, E.O., 2016. A review of the health problems of the internally displaced persons in Africa. *Niger. Postgrad. Med. J.* 23, 161–171

Spencer S, Grant AD, Piola P, Tukpo K, Okia M, Garcia M, et al. Malaria in camps for internally-displaced persons in Uganda: evaluation of an insecticide-treated bednet distribution programme. *Trans R Soc Trop Med Hyg.* 2004;98:719–27.

WHO (2013) Updates on the management of severe acute malnutrition in infants and children (Guideline). Available: http://apps.who.int/iris/bitstream/10665/95584/1/9789241506328_eng.pdf. Accessed 28 July 2014.