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CROSS SECTIONAL STUDY OF MALARIAL PARASITE AMONG PATIENTS ATTENDING GENERAL HOSPITAL, HADEJIA, JIGAWA STATE, NIGERIA

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ABSTRACT

A study was conducted to find out prevalence of malarial parasite among patients attending Hadejia General Hospital. A total of 227 people were screened in the study area. Out of this number 150(66.1%) were males, while 77(33.9%) were females. Overall prevalence of malarial parasite was found to be 114(50.2%). Prevalence of malarial parasite in males was found to be 78(52%), while prevalence in females was found to be 36(46.8%). There was no significant difference ($p > 0.05$) between the sex of the people and prevalence of the infection. Prevalence of malarial parasite in children aged 0 to 5 years has highest prevalence 37(53.4%), followed by children aged 6 to 15 years with prevalence of 56(50.3%) and lowest prevalence was obtained in people aged 15 years and above 25(40.4%). There was no significant difference ($p > 0.05$) between the age of the people and prevalence of the infection. The prevalence of malarial parasite was found to be high among patients attending Hadejia General Hospital.

Keywords: Hospital, Malaria, Prevalence, Parasite, Patient,

INTRODUCTION

Malaria is one of the common infectious diseases and a great public health problem worldwide (Dougnon, *et al.*, 2015). It is estimated that more than one million children living in Africa especially in remote areas with poor access to health services die annually from direct effect and indirect effects of malaria. In Nigeria, malaria consistently ranks among the five most common causes of death in children (Nmadu *et al.*, 2015). Malaria remains a major public health problem worldwide, causing about 216 million infections in the year 2010. Each year 80 to 90% of the world's malaria cases occur in sub Saharan Africa and approximately 19 to 24 million women are at risk of malaria and its adverse consequences. In area with stable malaria like Nigeria, the vast majority of infections with *P. falciparum* in pregnancy remain asymptomatic, undetected (Shulma, 1993).

This preventable disease has reached epidemic proportions in many region of the world and continues to spread unchecked (WHO, 2010) million children living in Africa die yearly from direct and indirect effect of malaria infection (Fawole and Onadeko, 2001). African children under five years and pregnant women are most at risk of malaria. Affected children often die less than 72 hours after developing symptoms. In those children who survive, malaria drains vital nutrients from them impairing their physical and intellectual development (WHO, 2000). The four known species of *Plasmodium* genus causing

human malaria are *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale* and *Plasmodium malarie* and they contribute to majority of human health problem in malaria endemic region of the world. The major vectors of human malaria are *Anopheles gambiae*, *Anopheles funestus*, *Anopheles arabiensis* and *Anopheles melas*. *A. arabiensis* is most predominant in the savannah areas and cities. *A. gambiae* in highly dense forest areas. *A. funestus* has uneven distribution, while *A. melas* is a species commonly found in salt water (Federal Ministries of Health, 1990).

Transmission of malaria is intense and stable in Nigeria because the intensity of attack remains constant throughout the year. In southern part of the country transmission rate is approximately uniform throughout the year. In the North there are marked differences between the high transmission rates in the short wet season (Lucas and Gills, 1998). Hence the aim of this study is to assess the prevalence of malaria in the study area.

MATERIALS AND METHODS

Study Area

The study was carried out between May and June, 2015 in Hadejia abattoir. The location of Hadejia local government area from Dutse – Jigawa State capital is East-North of about 171 kilometer by road. It is geographically located within Longitude 10° 05' East and Latitude 12° 30'.

The vegetation is Sudan savannah, the climate of the region is tropical wet and dry type. Rainfall spread over the period between June to November with mean annual rainfall of 315mm. Majority of the soil in the study area is sandy in nature except in Fadama area that has clay soil. The temperature of the study area is warm to hot though there is cool period between November and February. The mean annual temperature is 28°C though temporary variations do exist. Hadejia generally consist entirely of low plains of Chad basin sloping to the north-east with mean height of about 400 meter above sea level. (www.google.hadejia location).

River Hadejia provides water for irrigation and fishing, there is much open drainage that contains stagnant water that provide surface water. Majority of the people in the study area engage in animal rearing, farming (they grow both irrigated and rainfed crops) and fishing. The aerial extent as calculated by planners is 305 square kilometres and population of 659, 660 (2006 census) and this makes it the largest town in Jigawa state.

Sample Size and Sample Collection

The study was conducted on sample size of 227 people that include adult and children of both sexes, attending Hadejia General Hospital, Jigawa State, Nigeria. The Hospital serves people from Hadejia town and nearby villages from Hadejia emirate. Permission was first sought from hospital management with regards to collection of blood samples from patients that donate their blood for analysis.

Two meals of blood was obtained from peripheral vein into ethylene diamine tetra acetic acid (EDTA) bottle for preparation of thick and thin blood film. The blood samples were collected into EDTA bottles/containers which were labelled with information such as name of the patient, investigation, date, sex, age, laboratory and Hospital numbers. Subjects were screened for the presence or absence of malarial parasite within the month of May and June, 2016.

Parasitological Technique

Staining and identification of malaria parasite from collected blood samples was carried out as described by (Cheesbrough, 2004).

During this research, both thick and thin films smear were prepared. The thin films was flooded with Leishman stain for 2 minutes, Two drop of buffered distilled water of pH 6.8 was added for 10 minutes, the slide was washed thoroughly under tap water. The slides was left to dry and the back of the slide was cleaned with cotton wool. The thick films were flooded with 2% Giemsa stain and allowed to stand for 30 minutes. The slides were then washed using clean water and the back of the slides were wiped with cotton wool and placed in a draining rack with cotton wool to air dry (Cheesbrough, 2004) and Nmadu *et al.*, 2015).

The stained slide was examined for malaria parasite. Immersion oil was spread to cover about 10 mm diameter in the areas of the film. Both the thick and the thin smears prepared were examined microscopically under oil immersion (× 100) objective lens.

Statistical Analysis

Chi Square (X²) test was used to determine association between variables (Prevalence, sex and age) and their degree of significance at p<0.05 level of probability.

RESULTS

A total of 227 people were screened in the study area. Out of this number 150 (66.1%) were males, while 77 (33.9%) were females.

Table 1 shows prevalence of malaria infection according to sex in the study area. Out of this number 78 males were found to be infected (52.0%), while 36 females were found to be infected (46.8%). There was no significant relationship (p > 0.05) between the sex of the people and prevalence of the infection.

Table 2 shows prevalence of malaria parasite according to age in the study area. Children aged 0 to 5 years have highest prevalence 37(53.4%). It is then followed by people aged 6 to 15 years with prevalence equivalent to 56(53.3%) and people aged 15 years and above has lowest prevalence equivalent of 25(40.4%) respectively. There was no significant relationship (p > 0.05) between the age of the people and prevalence of the infection.

Table 1 Prevalence of Malaria Parasite According to Sex in the Study Area.

SEX	NE	NI	PREVALENCE (%)
MALE	150	78	52.0
FEMALE	77	36	46.8
P- Value	0.7151		
OVERALL	227	114	50.2

KEY: NE- Number Examined, NI- Number Infected,

Table 2 Prevalence of Malaria Parasite According to Age in the Study Area.

AGE	NE	NI	PREVALENCE%
1-5	69	37	53.4
6-14	106	56	50.3
15-ABOVE	52	25	40.4
P-Value	0.8896		
OVERALL	227	114	50.2

KEY: NE- Number Examined, NI- Number Infected,

DISCUSSION

The overall prevalence of malarial parasite among patients attending Hadejia General Hospital was 50.2%. The high prevalence observed in the present study may be due to fact that Hadejia is a low land, with a valley that contained irrigated land and many ditches closer to the town that provide surface water which facilitate the breeding site of mosquito's vectors, since surface water and pools facilitate breeding of the disease vector and subsequently spread the disease (Udomah, *et al.*, 2015).

This result is similar to the work of George *et al.* (2015) who reported 55.4% prevalence among women who had not taken antimalarial drug. The result of this study is closely related to the finding of Udomah, *et al.* (2015) who observed prevalence of malarial infection to be 55.2% among pregnant women attending Usman Danfodiyo University Teaching Hospital, Sokoto. This value is lower than the value reported by Kennedy, *et al.* (2015) who reported 67.5% prevalence rate of *Plasmodium falcifarum* among blood donors. The prevalence in the present study is higher than the value reported by Dougnon, *et al.* (2015) who reported 22% prevalence among people attending Aviation Medical Clinic Laboratory Murtala Muhammed Airport, Lagos. The differences in prevalence among geographical locations may be due to variation in climatic and ecological condition such as rainfall, temperature and altitude, which favour survival and development of mosquito vector, which spread the disease (Udomah, *et al.*, 2015).

The prevalence of malaria parasite in males was found to be 52.0% and in females 46.8%. The work in the present study is in conformity with the work of Nmadu, *et al.*, (2015) who reported 34% prevalence in males and 30% prevalence in females. The present result also conforms to the work of Mingistu and Solomon (2015) who reported higher values in males (55.4%) than females (44.6%). However studies have shown that females have better immunity to parasitic diseases and this was attributed to genetic and hormonal factors (Krogstad, 1996). Regarding the age group 0 to 5 years were found to be highly affected followed by 6 to 14 years old with 50.3% and lowest

value was obtained among 15 years and above (40.4%). This finding agrees with the work of Mingistu and Solomon (2015) who reported high prevalence in children aged 0 to 5 years followed by 16 to 20 years, the prevalence reduced with age as reported by Nmadu *et al.* (2015) who reported high prevalence in children 6 to 10 years followed by children 11 to 15 years. The reason why malaria affects this young age group might be due to the fact that people in older age group have better immunity than young who do not have fully develop immunity (Nmadu, *et al.*, 2015).

CONCLUSION

The prevalence of malaria parasite was found to be 50.2% among patients attending Hadejia General Hospital. The prevalence was slightly higher in males than females also a higher prevalence was recorded among young children than older people.

Recommendation

Health education should be encouraged to public in order to avoid stagnant water and clear breeding place for mosquito vector. Government should distribute Insecticide Treated Net free or at subsidized rate to public in order to reduce chance of exposure to the disease.

Authors Contribution

Abubakar, S. and Yunusa, I. designed the study and are involved in statistical analysis. Ahmed, M. K. Abdullahi, M. K recruited the subjects, Abubakar, S. and Ibrahim, I. were involved in Laboratory testing. Abubakar, S. and Zakariya, M. were involved in writing up the manuscript.

Conflict of Interests

The authors of this study declare that there is no conflict of interest related to the present work.

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REFERENCES

- Cheesebrough M. (2004): Distric Laboratory, Practice in Tropical Countries, part 1, published by Cambridge university press, 239 - 258.
- Dougnon, T.V., Bankole, H.S., Hounmanon, Y.M.G., Echebiri, S., Achade, P. and Mohammed, J. (2015): Comparative Study of Malaria Prevalence among Travellers in Nigeria (West Africa) Using Slide Microscopy and rapid Diagnosis Test. *Journal of Parasitology Research*, (6): 10 – 18.
- Fawole, O. I and Onadeko M. O (2010): Knowledge and Management of malaria in under five children by primary health care workers in Ibadan South East Local Government Areas. *Nigeria Post Graduate Medical Journal*. 8 (1): 1 to 5.
- Federal Ministry of Health (1990): Guidelines for malaria Control for Physicians in Nigeria. *Ministry of Health Lagos, Federal Republic of Nigeria* 1- 45.
- FMOH (1991): Federal Ministry of Health Malaria in Nigeria, *Epidemiology and Control Nigeria Bulletin of Epidemiology* 1(3); 1-19.
- George, I., Christ, O.A., Stephan, A.A., Stephan, N. and Diane, A. O. (2015): Prevalence of Malaria Parasitaemia among Asymptomatic Woman in Booking Visit in a Tertiary Hospital, North Central Nigeria. *Journal of Reproductive Biology and Health*, 3, 1 – 7.
- Kennedy, T., Wariso, Ibianabo, I., Oboro (2015): Prevalence of Malaria Parasitaemia among Blood Donors in Port Harcourt, Nigeria. *Advances in Microbiology*, 5, 351 – 357.
- Krogstad (1996): Malaria as Re-emerging Disease *Epidemiology Review*. 18: 77 – 89.

- Lucas and Gills (1990): A New Short Textbook of Preventive Medicine for the Tropics. *Malaria Great Britain ELBS with Edward Arnold Publishers*, 88 – 192.
- Mingistu Haile mariam and Solomon Gebre (2015): Trend and Analysis of Malaria Prevalence in ArsiNegelle Health Center, Southern Ethiopia. *Journal of Infectious Disease and Immunity*, vol. 7 (1) 1 – 6.
- Nmadu, P.M., Peter, E., Alexander, P., Koggie, A.Z., and Maikenti, J. I. (2015): The Prevalence of Malaria in Children Between the Ages of 2 to 15years visiting Gwarinpa General Hospital Life Camp Abuja Nigeria. *Journal of Health Science*, 5 (3): 47 – 51.
- Shulma, C. E (1993): Malaria in Pregnancy; its relevant to safe mother hood programmes. *Am. Trop. Parasitology* 93(1) 559 – 560.
- Udomah, F.P., Isaac Isah Zama.,Lukman, I.,Nwobodo D., OsaroErhabor., Abdulrahman, Y. and John, R.T. (2015): *Plasmodium*Parasitaemia among Pregnant Woman Attending Antenatal Clinic in Sokoto North Western Nigeria. *Journal of Nursing Science* 1 (1): 9 – 14.
- WHO (2000): Press release with WHO/48 Fact Sheet 5th July 2000. Geneva, WHO Publication. 1 – 18.
- www.goggle.hadejia location.