

TO STUDY THE SEASONAL VARIATION AND CLINICAL PRESENTATION OF MALARIA IN CHILDREN

Romana Ayub, Sartaj Khan, Umar Ayub Khan, Shafiullah, Junaid Ahsan, Jibran Umer Ayub

Department of Community Medicine, Khyber Medical College, Peshawar - Pakistan

ABSTRACT

Objectives: The main objectives were to study seasonal variation and clinical presentation of malaria in children.

Material and Methods: It was a retrospective hospital based cohort study conducted by the Department of Community Medicine in Pediatrics Unit B of Khyber Teaching Hospital, Peshawar. The clinical records from September 2008 to September 2009 were taken for analysis. A total of 184 cases treated for Malaria were included in the study. The age limit was up to 18 years including both male and female patients admitted into the ward. A questionnaire was formulated after thorough literature review, according to our aims and objectives. Data was obtained and processed manually, and then presented in tabular and graphical manner.

Results: Among the 184 cases, 28% were females while 72% were males. The highest numbers of cases were reported in June which was 17%, followed by July 11% and September 12%. Clinical presentation of Malaria included fever, fits, anemia, respiratory tract infections, diarrhea and vomiting. Three major types of malaria were mainly found which included simple malaria, cerebral malaria and clinical malaria. The age group most affected was found to be up to one year of age, while the incidence slowly declined with increasing age. Out of 184 cases 81% received oral treatment, 53% of which received anti malarial drugs. Parental treatment was given to 92% of the cases. Anti Malarial drugs were given to a total of 71% cases. After treatment, 96% cases showed improvement in health while only 1% case did not show any progress as it were discharged on will. Death toll was 3%.

Conclusion: It was concluded that malaria still remains the major cause of infant morbidity and mortality in developing countries like Pakistan. The peak season for malaria was from June to September. As malaria can present with different (mild to severe) signs and symptoms, the clinical manifestations seen in the children under study were ranging from mild headache and diarrhea to severe jaundice and fits.

Key Words: Malaria, Plasmodium Falciparum and Vivax, Seasonal Variation.

INTRODUCTION

The incidence of malaria worldwide is estimated to be 300-500 million cases each year. Most of 1-3 million who die each year from malaria are children, mainly in Africa, which is hyper endemic for malaria¹. In older children, malaria has a similar course as in adults. In endemic and hyper endemic areas, the mortality rate is highest during the first two years of life and severe falciparum malaria is the commonest cause of death in infants and children².

Malaria is a seasonal disease, affected by change in climate, mean temperature, night-time temperature, temperature in combination with rainfall and mean November and December temperature were found to be related to malaria in Zimbabwe and Khyber Pukhtoonkhawa province of Pakistan³. In Pakistan,

prevalence of plasmodium slide positively among the children treated for malaria at Rural Health Center (RHC) Jhangara, Sindh had a positivity rate of 5.9%⁴.

MATERIAL AND METHODS

It was a hospital based study, conducted in Pediatric B unit of Khyber Teaching Hospital, Peshawar. The study design was retrospective cohort study. The records of previous one year from September 2008 to September 2009 were taken for analysis. The total numbers of malaria cases recorded were 184.

The data was collected from the records of the Pediatric B ward, which was further verified by the admission charts of the patients available in the record room of the hospital and the epidemiological record of the concerned ward. The data was analyzed by SPSS software and finally presented in tabular and graphical manner in Microsoft Excel.

RESULT

A total of 184 cases were included in the study. Children ranging from newborn up to 13 years of age were included in the study. Among the 184 cases, 51(28%) were females while 133(72%) were males. One

Address for Correspondence:

Dr Romana Ayub

Assistant Professor

Department of Community Medicine,

Khyber Medical College, Peshawar - Pakistan

Tel: 091-9216206-10

E-mail: mahnoor_fm@yahoo.com

of the main objectives was to find seasonal variation in malaria throughout the whole year. It was observed that the peak season for malaria was from June to September. Three types of malaria were mainly found. Simple malaria was diagnosed in majority of the cases i.e., 129(70%) cases, followed by cerebral malaria 40(22%). Clinical malaria was the least prevalent type affecting 15(8%) of the subjects. The age group most affected was found to be upto one year of age, while the incidence slowly declined with increasing age, 60(33%) of cases occurred in children upto one year of age while 57(31%) of cases included children between one to three years of age. Among children with three to five years of age, an abrupt decline to 12(7%) cases was observed. While 39(21%) cases were reported in children between five to ten years of age and 16(8%) cases with children between ten to thirteen years of age.

The age group most affected was found to be children upto one year of age while the incidence slowly declined with increasing age. Out of the cases studied monthly variations in malaria were found during the study. It was observed that the peak season for malaria was from June to September.

Most frequently patients presented with fever as the chief complaint. Fits were common among patients with cerebral malaria, Anemia was the next leading chief complaint, Others include diarrhea, vomiting, malnutrition, jaundice and headache. Three major types of malaria were diagnosed including: Simple malaria (sign and symptoms and laboratory diagnosis both positive, but no complications present), Cerebral malaria and Clinical malaria (clinically sign and symptoms are positive but laboratory diagnosis is negative).

DISCUSSION

According to studies done in district Buner, highest rate of infection was 11.6% and was recorded in August while the lowest rate of infection 3.9% was noted in March⁵. Malaria in pediatric age group was investigated in 200 cases and results showed higher rate of Plasmodium vivax 62.5% than Plasmodium falciparum 36%⁶. Similarly studies on malaria in Karachi and other areas of Sindh showed Plasmodium vivax to be two times higher than Plasmodium falciparum⁷. On the other hand, results of the other studies showed that Plasmodium falciparum ratio was noted to be increasing in many districts of Sindh and Balochistan⁸.

About half of the world population lives in areas of high risk of malaria transmission and one fifth in very high risk areas¹⁰. The largest population at risk of malaria is South East Asia and Pacific regions. Worldwide the major pathogen responsible for causing malaria is *P. falciparum* and secondly *P. Vivax* which is same for Pakistan¹¹. The seasonal variations are almost same throughout the world i.e. the

incidence of malaria increases in summer and autumn and highly increases with rainy season. This supports our research in KTH, in which the incidence of malaria increases in June to September and peak incidence is in June.

Malaria in Khyber Pukhtoonkhawa was studied and it was observed that cerebral malaria was more common in males and most vulnerable group was pregnant ladies⁹.

The most vulnerable group among humans is children and pregnant women throughout the world¹². The rate of morbidity and mortality is more in the children under five years due to lack of immunization, poor social and economic conditions and lack of health education¹³, The children living in the rural area suffer more as compared to the urban areas¹⁴ and the clinical presentations were as follows: Headache, fever, diarrhea, anemia, fits, splenomegaly, involvement of brain, liver respiratory infections, DIC and the clinical findings seen are fever 41%, anemia 18%, fits 18%, respiratory tract infection 11%, Diarrhea 10%, Jaundice 3% and malnutrition 5%.

Administrations of drugs according to WHO recommendations, prevention of mosquito breeding by using the mosquito repellents has improved the health of community with reference to malaria. To improve treatment outcome and to counter the threat of resistance of Plasmodium to mono- therapies, combinations of anti malarial are now recommended by WHO for the treatment of malaria¹⁵. In KTH, major anti malarial drugs used are: Amodiaquine 38%, Quinine 38%, Artemether 10%, Artemether / lumefantrine therapy 13%.

Parental treatment was also given in case of emergency, majority of the cases in the study were uncomplicated cases of malaria and all of them showed improvement in health after receiving treatment.

CONCLUSION

It was concluded that malaria still remains the major cause of infant morbidity and mortality in developing country like Pakistan.

REFERENCES

1. Terry Devitt, The new UW study shows that a 4 percent increase in deforestation can spark a 48 percent jump in the incidence of malaria 16 June 2010
2. Modiano, Manifestations of severe malaria in Sub Saharan Africa 1998, www.geo.hunter.cuny.edu
3. Freeman and Bradley, Population of about 500 million is affected, with resulting deaths of between 1 to 2.7 to be related to the transmission of malaria 1996, www.jsd-africa.com

4. Hozhabri, In areas of low-to-moderate risk of malaria transmission, the World Health Organization, unstable malaria transmission; for detecting *P. falciparum* among children 2002.
5. Mohammad N and Hussain A, Studied prevalence of malaria in general population of district Buner and highest rate of infection (11.6%) was recorded 2003; 17: 75-80.
6. Jamal, frequency of various human malaria infections in hottest, malaria in pediatric age group of 200 cases was investigated by Jamal et al 2009.
7. Mahmood, Malaria in Karachi and other areas in Sindh was studied by WHO observed *P. vivax* to be two times higher than *P. falciparum* 2004. jpma.org.pk
8. Nizamani, Results: Out of 3340 suspected cases of malaria, 1095 (32.78%) were found to be... investigated fifty cases of cerebral malaria in children in 2004. www.pims.com.pk
9. Saleem et al, Malaria in North West Frontier Province (NWFP) was studied and observed cerebral malaria more common in males 2006 *pjbs*, 1620-1624 2008.
10. Simon Hay, for the study, led by Oxford University, researchers created a global map that identifies areas at high risk of malaria March 24 2009. www.news-medical.net.
11. Medical research council, Produced by the malaria research program of the medical research council 2001.
12. WHO, in Africa, 30 million women living in malarial-endemic areas become pregnant each year, a two-to threefold higher risk of severe malarial illness than non-pregnant women research in this area is therefore a high priority April 25 2003 www.who.int.
13. National Institute of Allergy and Infectious Diseases did a pilot study is to evaluate the use of (1) 'malaria prevalence', (2) 'malaria incidence' and (3) 'malaria mortality' as a measure May 4, 2006, clinicaltrials.gov.
14. Tedros A, Ghebreyesus, Mitiku Haile, Karen H, British Medical Journal Incidence of malaria among children living near dams in northern Ethiopia: community base incidence survey 1999.
15. The World Health Organization Guidelines for the treatment of malaria provides evidence-based and up-to-date recommendations for countries on malaria 2010.

ONLINE SUBMISSION OF MANUSCRIPT

It is mandatory to submit the manuscripts at the following website of JMS. It is quick, convenient, cheap, requirement of HEC and paperless.

Website: **www.jmedsci.com**

The intending writers are expected to first register themselves and then attach/submit the manuscript. If processing fee is not submitted before, it should be deposited with Managing Editor in cash or in the form of a Bank draft in the name of Editor JMS. Please follow the format and check list of the Journal. Author agreement can be easily downloaded from our website. A duly signed author agreement must accompany initial submission of the manuscript.