MALARIA IN PEDIATRIC AGE GROUP: A STUDY OF 200 CASES

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ABSTRACT

Objective: To evaluate the clinical presentation of malaria, its response to treatment and resistance to various drugs in children.

Design: Descriptive observational

Place and duration of study: From 1st April 2002 to 31st March 2004 at Department of Pediatrics, CMH Attock.

Material and methods: Children upto 12 years of age with fever and positive blood smear for malarial parasite (MP). Cases of Plasmodium (P) falciparum malaria were given either Quinine or Artemether and of Plasmodium vivax malaria were given Chloroquine phosphate.

Results: In 200 children of malaria, male to female ratio was 1:1, 125 (62.5%) cases were of P. vivax, 72(36%) were of P. falciparum, and 3 (1.5%) cases were having mixed infection. All cases of benign tertian malaria responded to Chloroquine. Fifty cases of P. falciparum received quinine, forty-nine responded, and in one case RIII was noted. In 23 cases of P. falciparum malaria Artemether was given, no resistance was noted.

Conclusion: The clinical presentation of malaria in children is similar to other malarious regions of the world, Artemether and Quinine are the drugs of choice for treating severe malaria caused by P. falciparum. However Artemether is an alternative for the treatment of malaria caused by the parasites with resistance to Quinine.

Keywords: Malaria, quinine, artemether

INTRODUCTION

Malaria is of overwhelming importance in the developing world today with an estimated 30 million cases and over one million deaths each year. Worldwide it is one of the 5 killers in pediatric population along-with gastrointestinal infections, acute respiratory infections, measles, and protein energy malnutrition. [1,2]. According to WHO, malaria is endemic in 91 countries predominately in Africa, Asia and Latin America with about 40% of the world's population at risk. [3]. Malaria infection in children is transmitted by the bites of infected Anopheles mosquitoes, less common modes of transmission are inoculation of infected blood, use of contaminated needle and from an infected mother to her infant during late pregnancy [4].

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P. falciparum malaria is the one, which is associated with the highest morbidity and mortality. If it is characterized by a high degree of parasitemia i.e., more than 5% RBC's are infected it is called severe infection and it can result into severe anemia, jaundice, hypoglycemia, pulmonary edema, acute renal failure, cerebral malaria, seizures and coma [5]. In areas of endemic malaria, the most common clinical presentation is that of uncomplicated infection with prompt recovery after treatment, however in non-immune individual, malaria may present in its most severe form [6,7]. Therefore rapid diagnosis and early treatment of clinical cases is central to the reduction of morbidity and mortality in malaria [8]. Due to self-treatment and indiscriminate use of antimalarial drugs, the incidence of P. vivax and P. falciparum malaria is changing frequently in different regions of the world and within Pakistan also [9]. The increasing prevalence of Chloroquine

resistance P. falciparum malaria is a serious public health threat to the global control of malaria, especially in poor countries like Pakistan. In many countries Chloroquine resistance account for more than 90% of malaria cases. In Pakistan resistance to Chloroquine is on the rise and reported in up to 16-62% of P. falciparum cases [10]. Chloroquine resistance P. falciparum malaria was first detected in Pakistan during the year 1981, in district of Sheikhupura of Punjab, since then the problem of drug resistance is gradually increasing in various other regions of Pakistan [11]. Increased prevalence of P. falciparum along with emergence of Chloroquine resistance has further worsened the situation. Recognition of severe Falciparum malaria and its prompt treatment is necessary to prevent the complications and deaths. Life threatening and serious conditions should be treated with drugs like Quinine or Artemether. Use of other drugs, as first line of treatment, should be avoided. [12].

This study was conducted to evaluate the clinical presentation of malaria, its response to treatment and resistance to various drugs in children in the Attock district, where malaria cases are seen throughout the year.

MATERIALS AND METHODS

This descriptive observational study was carried from 1st April 2002 to 31st March 2004 at Department of Pediatrics, CMH Attock. All children upto 12 years of age presenting with fever and positive blood smear for Malarial Parasite were included in the study. Partially treated patients receiving empirical antimalarial treatment in outdoor were excluded from study. In all cases clinical history and examination was recorded. Two ml blood was collected in EDTA for laboratory investigations that included thick and thin blood film for MP, hemoglobin levels and complete blood counts. Further investigations were carried out in all cases of severe/malignant tertian malaria i, e, blood sugar, urea, electrolyte, creatinine, liver function test, culture sensitivity and in children with altered consciousness CSF examination was also done. In children with severe anaemia reticulocyte count, RBC morphology, and urine examination for haemoglobinuria also carried out. All cases of P. Falciparum malaria were randomly given either Quinine or Artemether. Quinine dihydrochloride was given 10 mg/kg body weight (BW) diluted in 10% Dextrose every 8 hours until child stabilized and tolerate orally for a total of 10 days [1]. Artemether was given 3.2 mg/kg BW stat, followed by 1.6 mg/kg BW once daily for 5 days [13]. All cases of benign tertian malaria were given Chloroquine phosphate 10-mg/kg BW stat followed by 5-mg/kg after 6 hours then 5 mg/kg once daily for 2 days and in selected cases Fansidar (pyrimethamine/sulphadoxine) is given as a single dose for clinical cure [14]. Symptomatic supportive treatment was given where indicated. All patients were given indoor treatment. They were assessed daily and were discharged when blood smear became negative for Malarial Parasite. and were afebrile. Resistance to antimalarial treatment was graded as under:

R-I: Blood film is clear of parasites in one week, but relapses in 4 weeks.

R-II: Partial response in one week.

R-III: No significant response at the end of one week [15].

RESULTS

We received 200 children with malaria during the period under study. One hundred one (50.5%) were male and 99 (49.5%) were females. The age ranged from 4 months to 12 years with 129 (64.5%) children of less than 5 years age. There were 125 (62.5%) cases of P.vvivax while 72(36%) were P. falciparum and 3 cases were having mixed infection. The history of fever was present in all cases, 22 (11%) cases of Falciparum malaria were having altered consciousness and were suspected to suffer from cerebral malaria and needed intensive treatment. Main clinical features of patients are summarized in table-1. Fourteen (7%) children were severely anaemic (Hb <5 g/dL) and needed blood transfusion. Hematological parameters of patients are summarized in table-2.

Out of 125 cases of benign tertian malaria that received Chloroquine 84 recovered completely, while 41 cases treated in out door developed RII resistance, these were admitted and were re-administered Chloroquine combined with Fansidar, i, e, pyrimethamine/sulphadoxine [14]. All of these cases recovered completely. In 50 cases of P. falciparum malaria Quinine was given. Forty-nine responded to treatment, and in one case

RIII was noted, and this patient was changed to Artemether, to which he responded well. In 23 cases of P. falciparum malaria Artemether was given, no resistance was noted. Hypoglycaemia was seen during treatment phase in all cases of P. falciparum malaria requiring Dextrose infusion. Thrombocytopenia was noted in 134 cases.. Cerebral Malaria was the major complication seen in 22 cases while severe anaemia was seen in 14 cases requiring blood transfusion.

DISCUSSION

The clinical spectrum of malaria in this study was very close to the study of Banzal et. al, 1998, in our study we found vomiting in 48.5%, headache in 32% and diarrhoea in 18%, whereas Banzal et. al, found vomiting in 50%, headache in 28.8% and diarrhoea in 13% [16]. We found splenomegaly in 36% of cases where as it was 43.3% in another regional study by Bhalli et. al 2002 [15]. The relative frequency of P. vivax malaria was 62.5%, P. falciparum malaria was 36% and 1.5% shows mixed infection which is close to study by Nadeem M, et al, 2002, which was 82%, 16%, and 2% respectively [17], however it was contrary to another regional study by Khadim M.T 2002 which was 32%, 61%, and 7% respectively, and by Akbar J.U. 2002, with 35% and 65% respectively [9,18]. Thrombocytopenia was seen in 67% cases in our study, while it was in 70% by Nadeem M. 2002, and in 66% reported by Zahur et. al, 1999 [17,19]. Cerebral malaria was the major complication seen in 29% cases of P. falciparum malaria, which was 26% in another study, by Hensbreck et al, 1996 [15].

Forty-one cases of P. vivax malaria developed RII resistance these were those patients who were suffering from severe form of malaria and had history of irregular intake of Chloroquine in outdoors. Since there is no known resistance of P.Vivax to Chloroquine they were admitted and were re-administered Chloroquine combined with Fansidar i.e., pyrimethamine/sulphadoxine, for clinical cure [14]. All of these patients recovered completely.

Incidence of Quinine resistance is 2% in our study however Bhalli et al, found 3.4% resistant to Quinine [15]. No case of Artemether resistance was seen. In this study Artemether was used as alternative to Quinine in a selected number of patients as several studies in south East Asia has suggested that Artemether is more effective than Quinine in reducing the case fatality rate in severe malaria [20]. However all P. falciparum malaria children either treated with Quinine or Artemether responded well and recovered without any sequelae. Finding in Karachi by Haider G, et al, 2002, and by Taylor T.E. et al, 1993, in Malawi were consistent with our results where Artemether and Quinine resulted in almost identical cure rate in children with severe malaria [21,22].

Table-1: Main clinical features of patients. n=200

Symptoms/Signs.	Patients	%
Fever	200	100
Altered Consciousness	22	11
Headache	64	32
Vomiting	97	48.5
Diarrhoea	37	18.5
Splenomegaly	72	36

Table-2: Hematological parameters.

Laboratory Parameters	Patients	%
Haemogoblin <9-5 g/dl	104	52
Haemogoblin <5 g/dl	I4	7
Platelet count <150-50X10 ^{9} /L	122	61
Platelet count <50X10 ^{9} /L	12	6

CONCLUSION

The clinical presentation of malaria in children is similar to other malarious regions of the world. Chloroquine is still the drug of choice in P. vivax malaria, whereas Artemether and Quinine are the drugs of choice for treating severe malaria caused by P. falciparum. However Artemether is well-tolerated and effective alternative for the treatment of malaria caused by the parasites with suspected resistance to Quinine.

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