

# Clinical Presentation and Outcomes of Severe Malaria among Vivax Positive Children Age 2 to 14 Years Admitted in a Tertiary Care Hospital at Quetta

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## ABSTRACT

**Aim:** To determine the clinical presentation and outcomes of severe malaria among vivax positive children age 2 to 14 years admitted in a tertiary care hospital at Quetta.

**Methods:** This cross sectional study was carried out at Pediatrics Unit-ii of Bolan Medical Complex Hospital Quetta from January 2016 to June 2016. One hundred and twelve children of severe malaria among positive MP vivax in children 2 to 14 years of age in both genders were included.

**Results:** Among the 112 children 57.1% males and 42.9% were females. In majority the presentation of prolonged fever has been reported more than five days. Associated presentation was seizures in 24.1%, impaired consciousness in 37.5%, severe anemia in 43.7%, jaundice in 33.9% and shock in 9.8%, hemoglobinuria in 11.6% and hypoglycemia in 16.1%. The cerebral malaria was in 10.7%, acute renal failure in 1.8%, acute respiratory distress in 19.6% and thrombocytopenia in 69.6% patients.

**Conclusion:** Plasmodium vivax as progressively more familiar contributing agent for severe malaria in children among 2 to 14 years of age.

**Keywords:** Outcome, Vivax positive, Tertiary care hospital

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## INTRODUCTION

Malaria is a disease caused by parasitic protozoan's a genus Plasmodium<sup>1</sup>. Malaria is a major global health problem, approximately 3.3 billion people in 99 countries are at risk of malaria, among 207 million develop symptomatic malaria annually<sup>2</sup>. Majority are caused by infection with Plasmodium falciparum, an average of 650,000 deaths occur each year between 1980 and 2010<sup>3</sup>. Acute malaria with severe malaria is a major signs of organ dysfunction and elevated intensity of parasitemia<sup>4</sup> and history of fever with symptom of severe malaria and positive malarial parasite<sup>5</sup>. A study in south-western Tanzania found that the frequent symptoms of severe malaria during admission were convulsions, compensated shock, prostration, symptomatic severe anaemia, Coma and severe respiratory distress<sup>6</sup>. Zubairi et al<sup>7</sup> reported that most common complications were altered consciousness, metabolic acidosis, respiratory distress, jaundice, severe anemia, hemoglobinuria, shock 8%, multi-organ dysfunction and liver dysfunction<sup>7</sup>. Acidosis and hypoglycemia are the most common metabolic complications. So the aim of this is to mention the clinical presentation and outcome of severe malaria among vivax positive patients. Therefore, it is important to enable health services to provide emergency treatment by means of guidelines.

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## SUBJECTS AND METHODS

This cross sectional study comprised 112 children and carried out at Paediatrics Unit-II Bolan Medical College Hospital Quetta from January 2016 to June 2016. Children history of high grade fever  $>102^{\circ}\text{F}$  with at least one symptom of severe malaria plus malarial parasite test positive for vivax, age 2 to 14 years were included. Those children who have pharyngitis and bacterial and viral meningitis were excluded. Severe malaria was defined P. vivax parasitemia according to WHO criteria (1) severe anaemia Hb  $<5$  g/dL (2) prostration, inability to sit or eat although otherwise able to do so; (3) respiratory distress as sustained nasal flaring, subcostal recessions or Kussmaul breathing; (4) multiple convulsions as a respective history within the preceding 24 hours plus one directly observed convulsion; (5) impaired consciousness, defined as GCS  $<10$ ; (6) clinical jaundice; (7) hemoglobinuria, verified by dipstick; (8) circulatory collapse, defined as a systolic blood pressure  $<60$  and  $<80$  mm of Hg in children  $<5$  and  $>5$  years of age, respectively, plus cool limbs or weak or absent peripheral pulses; (9) abnormal bleeding; and (10) pulmonary edema; (11) hypoglycemia; and (12) hyperlactatemia; will defined as, glucose  $<40$  mg/dL [ $<2.2$  mmol/L], and lactate  $>$  or  $=5$  mmol/L, respectively. For severe malaria (confirmed clinically and parasitological) was subjected to detailed history, clinical examination and laboratory investigations in the hospital. All those will be then followed for manifestations and major outcomes among vivax positive patients. After taking

written informed consent from parents or caregivers, 4 ml of venous blood withdraw after sterilization in those who fulfilled the criteria of severe malaria. Malarial parasites will be counted on Giemsa-stained thick blood films per 200 white blood cells. The following laboratory tests were conducted; aminotransferase levels platelet count, serum bilirubin level, blood glucose, arterial lactate, serum creatinine, prothrombin time, blood hemoglobin levels partial thromboplastin time and x-ray chest. Cerebrospinal fluid will be obtained and will be examined in all study subjects with suspected cerebral malaria unless signs of increased intracranial pressure will be noted. All other information's will be recorded in proforma. Ethical issues will be considered and strictly controlled bias in study. Data was entered to SPSS version 16 for analysis.

## RESULTS

Among the 112 children, 64(57.1%) were males and 48(42.9%) females. Thirty children were <5 years, 57 children were 5–10 years, and 25 were above 10 to 14 years. 112 (100%) presented fever of more than 5 days. Associated features were seizures in 27(24.1%), impaired consciousness 42(37.5%), severe anemia 49(43.7%), jaundice in 38(33.9%) and shock in 11 (9.8%). Laboratory investigation showed in urine analysis hemoglobinuria 13(11.6%), hypoglycemia in 18(16.1%). All children letter followed for outcomes such as, cerebral malaria, acute renal failure, acute respiratory distress, shock and thrombocytopenia. The cerebral malaria was founded in 12(10.7%) patients, acute renal failure in 2(1.8%), acute respiratory distress in 22(19.6%) and thrombocytopenia in 78(69.6%) patients (Table 1).

## DISCUSSION

Malaria was presenting high risk factor and worse clinical outcomes in infants and children. In severe malarial patients Plasmodium vivax has got high risk agent in past some years. at our hospital mostly were vivax positive. Know P. vivax is an important cause of severe malaria in children with clinical manifestations like anemia, jaundice and thrombocytopenia.<sup>8</sup>

The most common finding in our study was fever in 100% cases and impaired consciousness was in 37.5% and seizure was in 24.1%. The frequency of convulsions among children in our study was higher than that reported in Ghana.<sup>9</sup> Another study, 150 children with positive malaria were observed. Among them one third of cases developed severe malaria as compared to those with P. Falciparum infected<sup>10</sup>.

Table 1: Frequency of different Clinical presentation and outcome

Variable	No.	%
<b>Clinical presentation</b>		
Fever	112	100.0
Severe anemia	4	43.7
Impaired consciousness	42	37.5
Hemoglobinurea	13	11.6
Jaundice	38	33.9
Seizures	27	24.1
Shock	11	9.8
Hypoglycemia	18	16.1
<b>Outcome</b>		
Cerebral malaria	12	10.7
Acute renal failure	2	1.8
Acute respiratory distress	22	19.6
Thrombocytopenia	78	69.6

In the present study, the shock was observed in 9.8%, hypoglycemia in 16.1%, Jaundice in 33% and hemoglobinurea in 11.6%, while in a study conducted at Agha khan hospital Karachi<sup>7</sup> where these observations were, jaundice in 89.5%, hemoglobinuria in 20.9%, shock in 1.7% and hypoglycemia in 1% among vivax positive malarial patients. In such study 20.5%, severe anemia by destruction of infected RBC and phagocytosis red by splenic clearance. Another study of 91 patients at Pakistan<sup>11</sup> with P. Vivax presented 11% of cases and severe anemia in 42% of patients while in this study it was 43.7%, thrombocytopenia 84% while in our study it was 69.6%.

Among important outcome renal failure, respiratory distresses were 1.8% and 19.6% respectively compare to a study at Agha khan hospital<sup>7</sup> where these were 3.4% and 7.8% among vivax positive malarial patients. An other study, Yadav et al<sup>12</sup> reported thrombocytopenia 83.2% cases with P. vivax malaria, requiring platelet transfusion only 13%. In contrast to our study, 69.6% of the severe malaria cases reported low platelet count. In the present study, 10.7% cerebral malaria cases was found due to sequestration of infected erythrocytes in vascular beds of the nervous system. P. vivax is a high risk contributor to the disease of malaria, including severe malaria, in a tertiary care setting at Quetta.

## CONCLUSION

Plasmodium vivax presenting as a major contributing causative agent for severe malaria in children from different areas of Balochistan who admitted in paediatric ward of a tertiary care hospital at Quetta with a multiple clinical presentation and their outcome.

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