Complicated Falciparum Malaria During Pregnancy

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Summary : **Complicated falciparum malaria is a grave condition to the life of both mother and foetus. The incidence of severe complications is very much pronounced in the gravid state. Invariably the complications are multiple and the ultimate recovery is poor inspite of the multidisciplinary approach. A prospective study was conducted in tertiary care centre of Orissa. The gravid women were particularly vulnerable to the development of cerebral symptoms, renal failure, respiratory distress, anaemia and hypoglycemia. The mortality in the pregnant women (39.39%) was significantly higher than in the non-pregnant group (17.64%).**

Introduction

Severe falciparum malaria in the gravid women constitutes a grave risk to the life of the mother and the foetus. The presence of multiple complications in these patients results in increased mortality in comparison to that in the nongravid women (Brabin, 1963; Loban & Polozok, 1985; WHO, 1990). The incidence of abortion, low birth weight, still birth, premature delivery in addition to the maternal problems like cerebral malaria, pulmonary complications, hypoglycemia make this a challenging problem (McGregor, 1984).

We conducted a prospective hospital based study on the severe and complicated falciparum malaria in Ispat General Hospital, Rourkela.

Materials and Methods

Pregnant women, admitted to the wards of Internal Medicine, Intensive Care Unit or Obstetrics & Gynaecology of Ispat General Hospital Rourkela, were taken up for the study.

Severe and complicated falciparum malaria were considered by the WHO criteria, 1990 as cited below :

a. Cerebral malaria (unarousable coma without seizure or when associated with seizure the coma persisting for more than 30 minutes after the seizure);
b. Renal impairment (S. cretinine > 3mg%);
c. Pulmonary oedema;
d. Hypoglycemia (Plasma glucose < 40 mg%)
e. Severe anaemia (Haemoglobin < 5 gm/dl);
f. Intravascular haemolysis (S. bilirubin < 3 mg/dl);
g. Circulatory collapse (Systolic Pressure < 70 mm of Hg)

A detailed clinical evaluation was made with particular attention to neurological status, respiratory and renal condition and foetal distress. Five ml. heparinised venous blood sample was collected for determination of plasma glucose, urea, serum creatinine, bilirubin, alanine aminotransferase, hemoglobin, total erythrocyte count, total and differential leucocyte count and parasite count.

Soon after confirmation of asexual form of P. falciparum in the peripheral blood smear, injection quinine dihydrochloride 10mg/Kg body weight in 5% dextrose or dextrose saline was infused over a period of 4 hours every 8 hourly till the patient was able to take orally and malaria parasites were negative in two consecutive smear examinations. Supportive measures like maintenance of

hydration, antibiotics for any concurrent infections, blood transfusion, dialysis etc. were given according to individual needs.

Observations

We studied 112 female patients admitted with complicated malaria of whom 55 were pregnant, 24 were primigravidae and 31 were multigravidae. Of the primigravidae, 9 were in the first, 5 in the second and 10 in the third trimester of pregnancy. In the mutigravidae, 5 were in the first, 11 in second and 15 in the third trimester. The median age was 25.5 years (range 18 to 38) in the pregnant group and 27 years (range 14 to 60 years) in the non-pregnant group. The median parasitemia was 5% (range 1 to 70%) in the pregnant group vs. 2% (range 0.5% to 11%) in the non gravid patients.

Multiple complications were observed in 38 of the pregnant and 22 of the nonpregnant group. Thirty-three pregnant patients and 17 non-pregnant ones had cerebral malaria. The recovery time from coma was prolonged in pregnant women (median 66 hours with range 18 to 144 hours) in comparison to that in the non-pregnant patients (36 hours, range 24 to 96 hours) ($p < 0.02$). The fluctuation of level of sensorium was an important feature of the pregnant women. Eight patients lapsed into coma after showing initial improvement in the sensorium and 2 of them subsequently died. Six patients who were admitted in semiconscious state developed deep coma after the expulsion of the products of conception and while they were under antimalarial and other supportive therapy. 11 patients had seizures, while in the non-pregnant group, 5 had seizures. (Table 1.)

Acute renal failure was noticed in 14 patients in the pregnant patients and 6 in the non-pregnant ones. The level 1 of serum creatinine and urea were significantly higher in the former. Hypoglycemia was noticed in 10 pregnant and 4 non pregnant cases. Four of them had it at the time of admission whereas in others it dropped to hypoglycemic levels during therapy. Respiratory complications were more pronounced among the pregnant women. Eight had pulmonary edema and 2 had ARDS inspite of diuretics, strict fluid maintenance and management of renal impairment. The presence of

Table - 1

Clinical features of severe malaria among pregnant and non-pregnant women

	Pregnant (n=55)	Non-Pregnant (n=57)	P
Age median25.5	27	ns	
(range)	(18-38)	(14-60)	
Multiple complications	38	22	0.01*
Renal failure	14	06	0.05*
Cerebral malaria	33	17	0.01*
Coma Recovery Time in hrs	66	36	0.02*
(range)	(18-144)	(24-96)	
Death	17	8	0.05*

ns = not significant

* = significant

pulmonary complications made the management difficult and was associated with poor prognosis.

Foetal distress was observed in most of the patients. Foetal loss occured in 16 patients either in the form of abortion (4), IUD (4), premture delivery (5) or lowbirth wei ht (3).

The mortality was very high in comparison to the non pregnant patients. Death occurred in 17 pregnant patients (30.91%) and 8 non-pregnant patients (14.04%).

Discussion

The clinical course of severe malaria in gravid patients is disastrous; the incidence of multiple complications is high in comparison to the non-gravid condition, as well as to the males. The mortality is high inspite of multidisciplinary and aggressive therapy. We also had similar observations in our present study. Cerebral malaria in the pregnant women presents a grim prognosis (Brabin, 1983; Loban & Polozok, 1985; WHO, 1990). The fatality is the highest in the primigravida in the second trimester.

The incidence of renal complications is high and the management is difficult owing to the perplexity in peritoneal dialysis during pregnancy and non-availability of haemodialysis centres. We had performed dialysis (either PD or HD) in 10 patients, of whom 8 survived.

Pulmonary complications are seen invariably in the pregnant patients, but the outcome is not always as grim as thought to be except for the development of ARDS, where the mortality is as high as 90%. ARDS may develop even in patients with normal or low central venous pressure (Mishra et al, 1993).

Pregnant women with malaria are extremely vulnerable to development of hypoglycemia. It may be observed at the time of admission or during the quinine therapy (White et al, 1983; Das et al, 1988). The common presenting features of hypoglycemia like abnormal behaviour, sweating and sudden loss of consciousness are also observed in cerebral malaria, and therefore can be misdiagnosed. Usually they respond rapidly to infusion of high concentration of glucose or inj. glucagon. However in one of our patients, the hypoglycemia persisted for more than 72 hours leading to death due to multiple complications. The mechanisms of exaggerated hypoglycemia in pregnant malarial patients is multifactorial : starvation, hyper-responsiveness to secretagogues like quinine, high metabolic demand of the infection etc (WHO, 1990).

The overall mortality in the pregnant women with severe malaria is higher than that in the nongravid patients. We observed the high fatality rate of 30.91% in comparison to 14.04% in the non-pregnant patients. A unique feature not yet highlighted is the prolonged period of coma in these patients (66 hours vs. 36 hours, $p < 0.001$). The pathogenesis could be high parasitic load, vascular clogging leading to hypoxia and anerobic metabolism and ultimately cerebral oedema (Patnaik et al, 1994; Terry 1988). Free radical injury and the liberation of monokines by immune system damages the vascular endothelium by reactive oxygen species in patients with cerebral malaria.

Anaemia during pregnancy is a common feature in the locality. It becomes accentuated with infections either acute or chronic. The degree of anaemia observed during the acute state of severe malaria is multifactorial. It may not be always a true reflection of severity of haemolysis. But severe anaemia is a life threatening condition to both mother and foetus. The mechanisms include malnutrition, aviatminosis, helminthiasis and chronic infections of any nature. Other contributory factors include intravascular haemolysis, drug induced haemolysis, G6PD deficiency and possibly free radical injury. The degree of anaemia

was much pronounced in the gravid state (Giles et al, 1969 ; WHO, 1990).

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