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MALARIA IN PREGNANCY WAD MEDANI MATERNITY TEACHING HOSPITAL

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ABSTRACT

This is a prospective hospital - base study conducted in Wad Medani Maternity Teaching Hospital, during the period from 5th of October 2003 to 30th of December 2003. The objectives of this study were to assess the status of malaria in the wards in Wad Madani Maternity Teaching Hospital, to determine the effects of malaria on the mother as well as on pregnancy outcome, and also to test the National Protocol for Treatment of Malaria during Pregnancy using Wad Madani Maternity Teaching Hospital.

Methodology: All pregnant women with malaria admitted to the hospital during that period were included in the study. Malaria was diagnosed by thick and thin blood film, Gimsa's stain. Severe falciparum malaria was diagnosed according to WHO criteria. NationalProtocol for Treatment of Malaria during Pregnancy was adopted in the management of all women. Patients were consider to be cure if symptoms and signs disappeared. The results were analyzed using SPSS. The total number of pregnant women included in this study was 210.

The main results of the study were: (i) severe falciparum malaria (73.4%), (ii) anaemia (98.6%) of whom 20%) was severe and (11 %) was very severe, (iii) hyperparasitaemia (46.7%), (iv) dehydration (33.3%) and (v) jaundice (20.5%). Complications on the fetus were: (i) preterm labour (44.1 %), (ii) low Agar's score

< 7 (55.9%), (iii) low weight < 2.5 (44.1 %) and (iv) perinatal death (5.5%).
Quinine was the main drugs used.

Conclusion: Pregnant women admitted to the hospital need intensive care. Although there was no mortality but morbidity was high. The current protocol is adequate in

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reducing mortality. Intervention to reduce poor pregnancy outcomes must reduce the burden of malaria in pregnancy.

Key words: Malaria, Pregnancy, Outcome, Maternity, Madani.

INTRODUCTION

Malaria exists in 100 countries but is mainly confined to poorer tropical areas of Africa ,Asia and Latin America .More than 90% of malaria cases and the great majority of malaria deaths occur in tropical Africa [1] .Pregnant women in malaria areas may experience variety of adverse consequences for malaria infection including ;maternal anaemia, placental accumulation of parasites, low birth weight ,prematurity and intrauterine growth restriction ,fetal parasite exposture ,congenital infection and infant mortality [2,3] .Malaria in pregnancy is one of the major causes of maternal morbidity worldwide, and leads to poor birth outcomes [4], malaria is a leading cause of death and illness in Africa ,affecting mainly young children ,infants and young pregnant women, specially in rural areas where access to health services is limited [5] . Malaria still remains one of the main public health problems in the world [6] . In Sudan, falciparum malaria is the main cause of maternal mortality and pregnant women experience variety of adverse consequences from malaria infection such as maternal anaemia, low birth weight and perinatal mortality [7-8] . In Eastern Sudan, an area where malaria is unstable seasonal transmission 23.7% of patient presented with one or more manifestations of severe malaria, 6.7% of perinatal death and 1.6% of matenal death is due to malaria [9] .In Gezira areas, central Sudan, an area of seasonal unstable malaria transmission [10] . Malaria was found to be a cause of severe anemia, jaundice, cerebral malaria, hypoglycaemia, pulmonary oedema, haemoglobin urea, hypotension and prematurity [11] and it is the main cause of maternal mortality in this area [12]. Hospital case control and community follow up studies were conducted in Gezira State showed that there was a significant association between low birth weight and malaria during pregnancy [13] and there was association between increase risk of neonatal mortality and maternal malaria [14] a study to investigate the impact of plasmodium falciparum infection in

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parturient in women documented a high prevalence of malaria parasitaemia and anaemia among parturient women in Central Sudan [I5] .

The objectives of this work were [1] to assess the status of malaria in the wards in Wad Madani Maternity Teaching Hospital, Gezira State Central Sudan. [2] to evaluate the effect of malaria on the mother as well as on pregnancy out come [3] to test the management protocol used for treatment of malaria in pregnancy - in reducing the morbidity and mortality of malaria during pregnancy.

METHODOLOGY

This is a prospective hospital - based study conducted in Wad Medani Maternity Teaching Hospital Gezira State. The target population was the pregnant women admitted to the hospital due to malaria during the period from 5th October 2003 to 30 December 2003 (Post - rainy season). 210 pregnant ladies who had matched the inclusion criteria were enrolled in the study. Those with Hypertension, Diabetes Mellitus, and intrauterine fetal death were excluded from the study. Malaria was diagnosed by thick and thin blood film Gemsa's stain. Severe falciparum malaria was diagnosed according to WHO criteria [16]. Patients were considered in the study if they had positive blood film for plasmodium fa1ciparum. Diagnosis of severe Fa1ciparum malaria and if one or more of the following criteria for severe malaria was found according to WHO. Hyperpyrexia (temperature> 40 ^{0}C), repeated generalized convulsions, severe anaemia (Hb <5 g/L), hypotension (sys BP < 70 mmHg) , Jaundice, pulmonary oedema, hypoglycaemia, evidence of disseminated intravascular coagulation, unarousable coma> 30 min (cerebral malaria), renal failure and hyperparasitaemia.The national Malaria control Programme [17] was adopted in the management of all women. Patients were managed according to the regimen used for treatment of malaria in pregnancy mentioned in the protocol. Quinine is the drug of choice for treatment of both severe malaria and uncomplicated malaria in pregnancy, a dose of 30 mg salt/kg per day in 3 divided dose and shift to oral quinine as soon as the

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patient can take oral medications to complete a 7 days treatment. Patients were kept in hospital for 7 days and were discharged after completing the full dose of quinine on day 8. Patients considered to be curede if symptoms and signs disappeared .A full history and physical examination were performed on the patients and data were recorded, using a pretested questionnaire. The following investigations were performed for all patients included in the study. Urine analysis was done; Blood was analyzed for Hb level, white blood cell count. Serum levels of bilurubin, albumin, urea, creatinine, calcium, alkaline phosphatase, alanine aminotransferase, blood glucose level were also performed. Ultrasound examination was performed to determine viability and gestational age. Parasitaemia was defined as > 10 parasites per field. Anaemia was defined as Rb with < 11 gm/dl and severe anaemia as haemoglobin less than 5 g/dl. Premature labour was defined as the delivery after 28^{th} weeks of gestation and before the 37^{th} week. Perinatal death was defined as death of the baby from 28 weeks in utero until the age of the one week.

Data was entered into computer and analyzed using statistical package for social science (SPSS). Simple frequency distribution, mean and cross tabulation were calculated.

Ethical clearance of the study was taken from scientific committee Educational Development and Research Centre University of Gezira. All patient gave oral consent to be involve in the study.

RESULT

The total number of patients included in this study was 210. The age was distributed as follow: 6.7 % less than 20 yrs, 61.4% (20 - 29) yrs, 10% (30 - 34) yrs, 21 %. (35 +).18.6% were illiterate, while 70% received general education and

11.4% were university graduates. 7.1 % had a history of stillbirth, 23.3% had a history of abortion.83.3% had malaria infection during the last 3 months of the present pregnancy, 67.7% of whom had 1-2 attacks, (32.3%) three attacks and more.

Table (1): distribution of patients according to the symptoms

Symptoms	Number	Percentage
Fever	148	70.5

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Vomiting	13	6.2
Headache	20	9.5
Abdominal pain	12	5.7
Vaginal bleeding	5	2.4
Labour pain	3	1.4
Convulsions	3	1.4
Others	6	3.0
Total	210	100

Table (1) shows the distribution of patients according to the symptoms. F ever was the main presenting symptom at the time of admission 148/210 (70.5%), headache 20/210 (9.5%), vomiting 13/210 (6.2), abdominal pain 12/210(5.7%), vaginal bleeding 5/210(2.4%), labour pain 3/210(1.4%) and others 9/210(4.3%) Table (2): distribution of patients by parity

Parity	No.	%
PG	63	30
2-4	96	45.7
5+	51	24.3
Total	210	100

Table (2): shows the distribution of patients by parity. 63/210(30%) of patients were primigravidae.It is worth mentioning here that the total number of primigravidae among the total population of pregnant women is not high.

All studied patients had antimalarial before admission. The type of treatment received before admission by the majority of patients was chloroquine 177/210 (84.3%). 281210 (13.3%) patients had quinine and that could be explained only by having under dose or possibly quinine resistant which is rare.

Table (3): Main clinical signs at the time of admission

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Sign	Number	Percentage
Coma	0	0
Convulsions	3	1.4
Dehydration	70	33.3
Jaundice	43	20.5
Palpable spleen	14	6.7
Palpable liver	12	5.7

Table (3) shows the main clinical signs encountered in the patients at the time of admission. None of the patients was in coma. The main signs were dehydration and jaundice; one third 70/210 (33.3%) were dehydrated and 43/210(20.5) were clinically jaundiced. Three patients presented with convulsions.

Table (4): Distribution according to body temperature

Temperature	Number	Percentage
37 C"	54	25.7
38 - 39 C"	88	41.9
40 + C"	68	32.4
Total	210	100

Table (4) shows the distribution of patients according to the temperature. Three quarters of the patients were febrile, temperature 38C’ or more. One third of the patients 68 (32.4%) presented with high fever 40C’ or more. 54 (25.7%) were febrile.

Regarding the degree of parasitaemia, the majority of patients had moderate to high parasitaemia. 25/210 (11.9%) patients had very high parasitaemia (> 10 parasites per field).Ultrasonography was used to estimate the gestational age. in more than one third of patient80/21 0(3 8.1 0/0) the baby was growthly retarded. One third of the patients studied 70/210 (33.3%) was found to be having Widal test positive at the time of admission.

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Table (6) Criteria of sever falciparum malaria.

Criteria	Number of cases	Percentage
Coma	0	0
Convulsion	3	1.4
Jaundice	43	20.5
Hyperpyrexia (> 40 C')	70	33.3
Hypotension (sy < 100)	12	5.7
Hyperparasitaema (< ++)	12	5.7
Very severe anaemia < 5 g/dl	23	11
Hypoglycaemia < 80	35	16.7

Table (6) this table shows the frequency of criteria of severe fa1ciparum malaria in the studied patients .Among the patients with severe fa1ciparum malaria the main criteria encountered were jaundice 43/198 (20.5%) and hyperpyrexia 70/198 (33.3%). Hypoglycaemia was diagnosed in 35/198 (16.7%) patients. Very severe anaemia in /198(11 %). Hypotension and hyperparasitaema were equally encountered 5.7%. None of the patients had coma 0/210(0%) and only 7/210 (1.4%) had convulsions. Out of 21 0 patients studied 74% had severe fa1ciparum malaria and only 26% had uncomplicated malaria Pregnancy Out come:

Out of 210 patients studied 34 patients delivered and outcome was known. Tables 7, 8, showed the results of the outcome; the pregnancy ended in abortion were not included because it was not possible to trace them after discharge.

Table (7) distribution of newborn by gestational age

Gestational age I weeks	Number	Percentage

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Less than 37	15	44.5
37 - 40	19	55.5
41 and more	Zero	Zero
Total	34	100

Table (7): shows that prematurity (less than 37 weeks of gestation) was a major complication of malaria in pregnancy 15/34(44.1 %). None of the pregnancies continue more than 40 weeks.

Table (8): Distribution of newborns by birth

Weight I kg	Number	Percentage
Less than 2.5 kg	15	44.1
2.5 -3.5 kg	17	50
More than 3.5 kg	2	5
Total	34	100

Table (8) shows that a large number of the babies 15/34(44.1 %) were weighing less than 2.5 kg and only 2 babies were weighting 3.5 kg or more.

This study showed that more than half 19/34 (55.9%) had an Apgar's score less than 7. There were two perinatal deaths 2/34(5.50/0).

The above mentioned results show that prematurity was a major complication leading to low birth weight, low Apgar score and the perinatal deaths.

Regarding the distribution due to parity, our study showed that the number of primigravidae 12/34(35.3%), parity between 2-4 was 13/34(38.2%) and 5+ is 9/34

(26.5%).

DISCUSSION

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This study showed that there was no mortality due to malaria. Previous reports showed that in 2000 the percentage of deaths due of malaria out of all mothers death was 10.26%, in 2001 was 19.440/0, in 2002 was 24.14% and in 2003 was 8.82% [12] . this is similar to result of prospective stud done in the same area during the period from Sep 1997 to Jan 1978 which documented no death due to malaria [11] .The reduction of maternal mortality due to malaria to zero% is possible due to fact that the preventive measures adopted in the region (Role Back Malaria) is effective, in addition to the effective protocol for management of malaria during pregnancy, beside, the increase of a awareness and understanding of malaria in pregnancy among the practicing doctors.

The falciparum malaria manifested itself severely during pregnancy: jaundice 20.50/0 (other causes were excluded), dehydration 33.3%, hyperpyrexia 33.3%, hypotension 5.7%, hyperparasitaema 5.7%, very severe anaemia 11 % and hypoglycaemia 16.7%. None of the patients presented with coma and only (1.4%) presented with convulsions. Fever was the main presenting symptom at the time of admission (65%), less than the percentage of (77.1 %) in the previous report [11]. and the disease is therefore even more serious at this time, beside that other factors can be included such as inadequate management at home prior to admission and the delay in seeking medical advice. Only 6.7 % of our patients presented with palpable spleen and 5.7 % with palpable liver, this indicate that spleenomegaly and hepatomegaly are not signs of severe falciparum malaria but they are a signs of repeated attacks of malaria. Plasmodium falciparum resistance to antimalarial drugs is an important problem and a number of studies have described increasing resistance particularly to chloroquine, sulphadaxinepyrimethamine and even quinine [18] quinine resistance has been reported in eastern Sudan among non pregnant patients [19] , 86.5 % of our patients had received chloroquine therapy before admission to the hospital while quinine was prescribed in 98 %.

Chloroquine resistance is possibly due to wide spread of use of the cheapest and a available drug without medical advice and not in a proper way, also genetic mutation of the parasite could be the possible cause. Malaria was found to be the leading cause of low birth weight, our study indicated that the incidence of preterm labour was 44.5 % , this percentage is high when compared with 9 % in same area [19] and 36 % in Malawi [2] . The incidence of low birth weight « 2.5 kg) in our study was 44.1 %, a prospective case control study in the same area aimed to evaluate the efficacy of

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sulfdoxine/ pyrimethamine as prophylactic intervention in prevention and control malaria during pregnancy showed 35.8 % low birth weight in the control group and 35.5 % in the interventional group [21] another study also conducted in Central Sudan showed a percentage of 18.1 % [20] and very high compared with 9.6 % in Cameroon [21]. we reported in this study 5.5 % of peerinatal death, this percentage is slightly high when compare with 5.4% in previous study in Gezira [22] ,so attendance of labour by a Pediatrician is recommended.

CONCLUSION

Pregnant women admitted to the hospital need intensive care. Although there was no mortality but morbidity was high. The current protocol is adequate in reducing mortality.Intervetion to reduce poor pregnancy outcomes must reduce the burden of malaria in pregnancy.

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