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Original Research Article

Severe malaria during pregnancy at the maternity ward of the municipal medical center of Ratoma, Guinea-Conakry

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ABSTRACT

Background: Gestational malaria remains a major public health problem in malarious areas. The objectives of this work were to describe the socio-demographic, clinical, paraclinical, therapeutic and prognostic characteristics of patients who developed severe malaria during pregnancy.
Methods: It was a descriptive prospective study carried out in the maternity ward of Ratoma municipal medical center, which was carried out over a period of 6 months from 01 October 2018 to 31 March 2019. This study involved all pregnant women who had presented severe malaria according to WHO criteria.
Results: The incidence of severe malaria during pregnancy was 7%. The average age of our patients was 22.4 years with extremes of 15 and 47 years. The symptomatology that motivated the consultation was variable, the most frequent signs were: hyperthermia (100%), headache (79%), vomiting (99%). The general examination at admission objectified a fever with an average temperature of 39°C with extremes of 38-40.4°C. All patients had a positive rapid diagnostic test (RDT) as well as their thicker drop. The hemogram revealed the existence of a more or less severe anemia in 89.9% of cases. All patients were treated with parenteral quinine (100%). Maternal lethality was 1.8%. After severe malaria, 70 patients (62.5%) carried their pregnancy to term and 40 delivered an eutrophic child (35.71%), 30 (26.78%) delivered a hypotrophic child, 20 (17.85%) had a spontaneous abortion, premature delivery was observed in 10 patients (8.9%), and fetal death in utero was observed in 12 patients (10.71%).
Conclusions: All patients had received parenteral quinine curative therapy. Maternal and perinatal complications were common. To improve this prognosis, intermittent preventive treatment and the use of insecticide-treated nets, which are the most effective prevention method at this time, must be further promoted in anticipation of the much hoped-for vaccine.

Keywords: Severe Malaria, Pregnancy, IPT, Ratoma

INTRODUCTION

Severe malaria is defined by the presence of asexual forms of plasmodium falciparum in the blood, associated with at least one of the World Health Organization (WHO) criteria: i) Major criteria- Disturbance of consciousness, convulsions repeated at least twice every 24 hours, respiratory distress, circulatory collapse, pulmonary edema, macroscopic hemoglobinuria, metabolic acidosis (pH lower than 7.25 or bicarbonate lower than 15 mmol/l, hyperlactatemia: plasma lactases higher than 5 mmol/l, hypoglycemia lower than 2.2 mmol/l (0.4 gm/l), severe anemia: hematocrit lower than 15% or hemoglobin lower than 5 gm/dl; renal failure

(creatinine higher than 265 mmol/l). ii) Minor criteria-Fever with rectal temperature over 40°C, prostration, jaundice clinically detected or biologically defined by bilirubinemia higher than 30 mg/l, parasitemia higher than 50%.[1]

Gestational malaria remains a major public health issue in malarious areas. Numerous studies have shown that malaria and pregnancy influence each other.[1,2]

Five species are transmitted to humans: *Plasmodium falciparum*, *Plasmodium malaria*, *Plasmodium oval*, *Plasmodium vivax* and *Plasmodium knowlesi*. Plasmodium falciparum is the most dreadful species and it is the one that kills. In tropical countries malaria is the most frequent parasitic disease and poses the most problems in pregnant women.[3]

According to the WHO, there are approximately 25 million pregnant women at risk of malaria each year, 25% of whom have a placenta infested with plasmodium at the time of delivery. In Africa, between 75,000 and 200,000 children are born to women with malaria, with a low birth weight.[4] The mortality at birth of children of malaria-infected mothers is estimated at 100,000 per year, with a rate of 0.9% in urban Zaire and 10.6% in rural Gambia.[5,6]

In areas with stable transmission, malaria is particularly frightening in pregnant women. Clinical signs and obstetric complications vary according to the local conditions of transmission.[2,7] The occurrence of severe malaria in pregnant women can have serious consequences for the health of the mother (anemia), the fetus (intrauterine growth retardation and fetal death in utero), and the newborn (premature, hypotrophic).[8-10]

The objectives of this study were to describe the socio-demographic characteristics of patients who developed severe malaria during pregnancy, to describe the clinical signs and biological parameters of severe malaria in pregnant women, and to describe the treatment regimen adopted in the maternity ward of the Ratoma municipal medical center.

METHODS

It was a descriptive prospective study carried out at the maternity ward of the Ratoma municipal medical center that lasted for a period of 6 months from 01 October 2018 to 31 March 2019.

Inclusion criteria

This study included all pregnant women who had severe malaria according to WHO criteria. We included, after a documented informed consent, all pregnant women who showed up with hyperthermia. Each patient was then given a rapid diagnostic test called ICT malaria and a thick drop. The ICT malaria test is based on the detection of the plasmodial antigen using an immunochromatographic method with a specific monoclonal antibody absorbed on a strip. The diagnosis of malaria was agreed on when the thick drop was positive;

Exclusion criteria

All patients with a negative thick drop were secondarily excluded from the study.

Pregnant women who developed severe malaria were treated with quinine. After their discharge, patients received prenatal follow-up until delivery and postpartum.

Studied parameters were the following: socio-demographic characteristics, clinical and paraclinical data, the evolution of severe malaria, the pregnancy outcome and post-partum.

RESULTS

Frequency

During the study period we recorded 112 cases of severe malaria associated with pregnancy out of a total of 1678 consultations, i.e. a frequency of 7%.

The average age of our patients was 22.4 years with extremes of 15 and 47 years, the 15-19 and 20-24 age groups were the most affected (33.92% and 36.60% respectively), and primiparous women were the most affected (53.6%). The average parity was 3.2 with extremes of 0 and 9.

Very few patients (6%) used insecticide-treated nets (ITNs) to protect themselves from anopheles bites.

Intermittent preventive therapy (IPT) with absorption from the second trimester of pregnancy of 3 tablets each containing 500 mg of sulfadoxine and 25 mg of pyrimethamine with one month interval between doses has been reported in 23.5%.

Clinical data

The average gestational age at the time of occurrence of severe malaria was 29 weeks with extremes of 6 and 39 weeks. The symptomatology that motivated the consultation was variable, the most frequent signs were: hyperthermia (100%), headache (79%), vomiting (99%), physical asthenia (80%), abdominal pain (68%). The general examination at admission objectified a fever with an average temperature of 39°C with extremes of 38-40.4°C.

Paraclinical data

All patients had a positive rapid diagnostic test (RDT) and a thick drop. The hemogram revealed the existence of a more or less severe anemia in 89.9% of cases.

Therapeutic data

All patients were treated with parenteral quinine (100%); other medications used were adjunctive and included antipyretics (100%), antiemetics (80%), tocolytics (20%) and anticonvulsants (16%).

The average gestational age at the time of treatment was 4 days. The effectiveness of the treatment was evaluated on the disappearance of clinical signs and the negativation of the thick control drop.

Prognosis

Maternal prognosis

Among the 112 patients with severe malaria, 110 (98.2%) had a favourable evolution from day one with a normalization of temperature and disappearance of symptoms. On the other hand, the 2 women suffering from neuromalaria and acute renal failure finally died despite the treatment administered, i.e. a maternal lethality of 1.8%. These two clinical cases are the following:

First case: This case concerned a 25-year-old primigravida nulliparous patient evacuated from a suburban maternity hospital for neuromalaria associated with a 28-week pregnancy; severe anemia (hemoglobin level of 4.5 gm/l) and an acute renal failure. Despite her regular prenatal follow-up, she had not benefited from intermittent preventive treatment (IPT). The obstetrical examination and the obstetrical ultrasound carried out on her arrival lead to the conclusion that death occurred in utero. After induction of labour with misoprostol she expelled a 2000 g macerated fetus. The clinical picture continued to worsen despite the therapeutic relay operated with an artemisinin derivative and the patient died after 6 days of hospitalization.

Second case: The case concerned a 27-year-old, gestity III and parity II patient, admitted for cerebral malaria associated with a 26-week pregnancy. She had not undergone any prenatal consultation. She had not received the IPT. The clinical presentation at admission was associated with fetal death in utero, coagulation disorders, neuromalaria and an acute renal failure. The patient died 3 hours after admission.

In the post-partum, the follow-up was favourable for the rest of the patients. These patients then benefited from follow-up and IPT prophylaxis for the rest of their pregnancy.

Perinatal prognosis

After severe malaria, 70 patients (62.5%) carried their pregnancy to term and 40 gave birth to an eutrophic child (35.71%), 30 (26.78%) gave birth to a hypotrophic child, 20 (17.85%) had a spontaneous abortion, premature delivery was observed in 10 patients (8.9%), and fetal death in utero was observed in 12 patients (10.71%).

Table 1: Characteristics of pregnant women who developed a severe malaria during pregnancy.

Maternal characteristics	Number	Percentage
Age (years)		
15-19	38	33.92
20-24	41	36.60
25-29	21	18.75
30-34	7	6.25
35 and over	5	4.46
Parity		
Primiparous	60	53.6
Paucipares/pauciparous	36	32.1
Multiparous	11	9.8
Major multiparous	5	4.5
Pregnancy age (weeks)		
Under 13 weeks	44	39.2
14-28 weeks	36	32.78
Over 28 weeks	32	29.1
Number of ANCs		
None	13	11.60
1-3	93	83.03
4 and over	6	5.12
Socio-professional layer		
Liberal	44	39.28
Secondary school and university students	30	26.78
Housewives	28	25
Wage earners	10	

Table 2: Pregnancy outcome in pregnant women who developed severe malaria.

Pregnancy outcome	Number	Percentage
Full-term delivery	70	62.5
Spontaneous Abortion	20	17.85
Preterm delivery	10	8.9
Fetal death in utero	12	10.71
Total	112	100

DISCUSSION

Frequency

This study shows that the prevalence of malaria in pregnancy is high (7%) despite IPT with sulfadoxine pyrimethamine (SP). This figure is lower than that reported by LUKUKA KA et al in DRC (21%).[11] This

difference could be explained by the introduction of IPT and the use of ITNs.

Patient characteristics

Malaria gestates had a particular profile. Consistent with previous studies, the age of our patients was superimposed on that of other pregnant women we generally receive; this supports the fact that age does not seem to play any role in the susceptibility of pregnant women to develop severe malaria. On the other hand, parity is incriminated as a factor favoring the development of severe malaria.[12-15]

Classically, the data report a greater sensitivity of primiparas and a decrease of this sensitivity according to the rank of the pregnancy.[16-19] In our series primiparous and pauciparous were the most concerned.

The symptomatology of severe malaria was very evocative in our context. However, other infectious pathologies, whose treatment is totally different, can simulate severe malaria, therefore it is recommended as much as possible to ask for paraclinical confirmation.

For this reason, the thick drop remains the reference examination, but it is not always accessible in the emergency room and in all our maternity hospitals (shortage of blood smear material or lack of laboratory). To solve this problem the ICT malaria rapid test is a reliable alternative, it is also less expensive and more accessible because it does not require any special equipment or skills.

Overall, the maternal prognosis is relatively poor for the combination of severe malaria and pregnancy, with lethality ranging from 0 to 4% depending on the authors.[11,12,14,19-22]

The lethality of 1.78% recorded in our series may seem high, but it could be explained by the weakness of the technical platform in the management of the most serious cases. The course of pregnancy is always uncertain when severe malaria occurs, and is often marked by complications, the most frequent of which, including in our series, are abortions (12-18%) and premature delivery (8-10%).[12,14,17,20,22]

The perinatal prognosis is always pejorative. All the studies agree on the relatively high risk of fetal death in utero (10-8%), fetal hypotrophy (15-30%), and fetal distress during labour.[12,17,21,23,24]

With regard to congenital malaria, we have not encountered one in our series, but it is an entity whose existence is recognized. It remains relatively rare with a frequency of 0.5 to 5% according to the authors.[12,25]

Therapeutically, quinine still remains the reference molecule for the treatment of malaria in pregnant women, even if it is not without side effects, particularly hypoglycemia due to hyperinsulinism. With the development of resistance, the use of artemisinin derivatives is becoming increasingly accepted, but caution must be exercised, especially during the first half of pregnancy, as the data currently available are limited and the risk is neither confirmed nor refuted.[26,27]

To improve the overall prognosis of the association between malaria and pregnancy, it is necessary to develop primary prevention in order to reduce the incidence of malaria infestation in pregnant women.

Two methods are currently recommended and have proven to be effective. They are: 1) the use of insecticide-treated nets.[26,28,29] 2) Intermittent preventive therapy (IPT) with absorption from the second trimester of pregnancy of 3 tablets each containing 500 mg of sulfadoxine and 25 mg of pyrimethamine with one month interval between doses has been reported in 23.5%.[26,30]

Limitations and difficulties were the results can only be applied to the study site. The weakness of the technical platform for resuscitation and the unavailability of certain additional examinations necessary for the taking of serious cases were our main difficulties.

CONCLUSION

Malaria is the most widespread tropical parasitosis. Its association with pregnancy is relatively frequent because of poor compliance with preventive measures by pregnant women. Emergency diagnostic problems can be solved by using a rapid ICT malaria test. The symptomatology that motivated the consultation was variable, with the most frequent signs being hyperthermia, headache, vomiting, physical asthenia and abdominal pain.

All patients had received parenteral quinine curative therapy. Maternal and perinatal complications were common. To improve this prognosis, intermittent preventive treatment and the use of insecticide-treated nets, which are the most effective prevention method at this time, must be further promoted in anticipation of the much hoped-for vaccine.

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