RESEARCH ARTICLE

Clinical Study on Spectrum of Dengue Morbidity in Pregnancy and Its Impact

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Abstract

Introduction: Dengue is a mosquito borne viral disease transmitted by Aedes. Dengue infection in pregnancy carries the risk of hemorrhage for both the mother and the newborn. In addition, there is a serious risk of premature birth and fetal death. In case of infection close to term, there is a risk of vertical transmission. Timely intervention can improve the maternal as well as fetal outcome. This study was aimed to assess the presentation, maternal and fetal outcome of dengue fever (DF) during pregnancy.

Materials and methods: The study was carried out on 35 pregnant females diagnosed and serologically confirmed to have DF and who were admitted in Vydehi Institute of Medical Sciences and Research Centre. Patients were included irrespective of the period of gestation. Serological testing for dengue virus-specific antigen and antibody was done for the diagnosis. Proforma was designed accordingly and used to collect data. Informed written consent was obtained.

Result: In the present study on 35 patients suffering with DF, they are presented as the following in each trimester: 9 patients in the first trimester, 8 of them in the second trimester, and maximum, i.e., 18 patients, in the third trimester. About 13 cases were diagnosed by the nonstructural protein 1 (NS1) antigen, 17 by the immunoglobulin M (IgM) antibody, and 5 by the immunoglobulin G (IgG) +IgM antibody. Only two cases were febrile at delivery, but there was no case of dengue in infants. Platelet transfusion was required in four patients who had platelet <30,000. Term delivery was in 19 (54%) patients, preterm in 6 (17%) patients, lost to follow up 5 (14%) patients, and abortions in 5 (15%) patients. Out of 25 deliveries, 13 (52%) of them were full term normal delivery (FTND), 12 (48%) were lower segment cesarean section (LSCS), and none were complicated by postpartum hemorrhage. No cases of neonatal transmission were noted.

Conclusion: Dengue infection in pregnancies need multimodal approach and treatment for potential fetal and maternal complications. Early detection and appropriate fluid administration and monitoring can decrease the mortality and morbidity associated with dengue infection.

Keywords: Dengue fever, Neonatal transmission, Platelet transfusion, Postpartum hemorrhage.

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Introduction

Dengue is the most prevalent mosquito-borne viral disease affecting humans. The causative agent is dengue virus (DENV) (family: Flaviviridae, genus: *Flavivirus*), an *Aedes*-transmitted virus that occurs as four serotypes. Dengue is endemic in most, if not all, tropical and subtropical countries, and about half of the world's population is considered to be at risk.[1–3]

The world health organization (WHO) previously classified dengue using three disease categories: dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome.[4] Due to several shortcomings in the classification scheme, most notably the underestimation of disease severity in some patients,[5,6] the WHO revised their guidelines in 2009.[7] Dengue cases are now classified as either dengue with or without warning signs or severe dengue. Dengue without warning signs presents as an acute febrile illness with at least two of the following: nausea/vomiting, rash, aches and pains, leukopenia, and a positive tourniquet test. Warning signs are defined as abdominal pain, persistent vomiting, fluid accumulation, mucosal bleeding, lethargy, liver enlargement, and increasing hematocrit with decreasing platelets, and at least one must be observed to fulfil the diagnosis of dengue with warning signs. Severe dengue is associated with severe plasma leakage, severe bleeding, or organ failure.

Significant outbreaks of DF occur every 5 or 6 years. There tends to remain a large number of susceptible people in the population despite previous outbreaks because there are four different strains of the DENV and because of new susceptible individuals entering the target population, either through childbirth or immigration. Dengue infection in pregnancy carries the risk of hemorrhage for both the mother and the newborn. In addition, there is a serious risk of premature birth and fetal death. In case of infection close to term, there is a risk of vertical transmission. Hence, the knowledge of its diagnosis and management is of vital importance.[8]

Materials and Methods

The present study was carried out in Vydehi Institute of Medical Sciences and Research Centre, Department of Obstetrics and Gynecology.

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It was a hospital-based retrospective analysis of all the pregnant women with confirmed dengue infection irrespective of the gestational age. About 35 patients with dengue serology positive were included. Antenatal patients with clinical features of DF during the study period were examined, and laboratory investigations like dengue NS1 antigen and IgM and IgG antibody were used to confirm the diagnosis of dengue.

Analysis was done with respect to the age of the patient, gestational age of pregnancy, complications at presentation, laboratory diagnosis, platelet counts, and treatment offered.

The outcome of pregnancy like abortion, preterm delivery, and term delivery were noted. Birth weight and condition of fetus at birth were noted. Maternal mortality and morbidity were also noted. Laboratory diagnosis was done by using enzyme linked immunosorbant assay (ELISA). Complete blood count (CBC), RFT, and LFT were done daily or on the second day in case of uncomplicated dengue. In cases of complicated dengue, CBC was repeated twice daily.

Fetal heart rate (FHR) monitoring was done every 4th hour.

The daily fetal movement count (DFMC) chart was maintained.

All records, registers, in the study period maintained in the present tertiary care hospital were used for this purpose.

Patients with the platelet count less than 30,000 or with bleeding manifestations were transfused with platelets.

All the results were plotted in a master chart. Descriptive frequencies, percentage, and charts were used, and data analysis was done.

Results

In the present study of 35 patients suffering with DF, data regarding obstetric and fetal outcomes were collected.

The present study had 9 patients in the first trimester, 8 in the second trimester, and maximum, i.e., 18, in the third trimester. About 13 cases were diagnosed by NS1 antigen, 17 by IgM antibody, and 5 by IgG +IgM antibody. Only two cases were febrile at delivery, but there was no case of dengue in infants (Table 1).

Table 1: Dengue infection

Dengue information		*No.*
Trimester of dengue infection	First trimester	9
	Second trimester	8
	Third trimester	18
Maternal dengue diagnosis method	NS1 antibody	13
	IgM antibody	17
	IgG + IgM antibody	5
Febrile at delivery	Yes	2
	No	33

Table 2: Maternal outcome

Spectrum	*Outcome*	*No*
Dengue fever	Uneventful	33
Dengue hemorrhagic fever	ICU admission	2
Dengue shock syndrome		None
Platelet transfusion	Yes	4
	No	31
Blood transfusion	Yes	None
	No	35

Table 3: Outcome of pregnancy

Parameters		*No*	*%*
Outcome of pregnancy	Abortions	5	15
	Term	19	54
	Preterm	6	17
	Lost to follow up	5	14
Mode of delivery	Full term vaginal delivery	13	52
	LSCS	12	48

Patients presented with fever, including other constitutional symptoms like severe headache, vomiting, myalgia who recovered with supportive management. Women with uncomplicated DF were 33 (94%) and had uneventful outcomes and were discharged. Two (6%) of the dengue seropositive women met the criteria for DHF (Table 2).

The first case of DHF was primi at 28 weeks with features of raised hematocrit, coagulopathy, and thrombocytopenia—requiring ICU admission, platelet transfusion, and fresh frozen plasma (FFP). Patient recovered and was followed up till delivery with no evidence of morbidity.

The second case of DHF was G2P1L1 with 26 weeks period of gestation (POG) with features of thrombocytopenia, raised hematocrit with epistaxis requiring ICU admission and FFP, and platelet transfusion.

No morbidity in early trimester was noted. The second and third trimester had varied presentation, and the obstetric scan was normal.

Hemoglobin was within the normal range. An elevated hematocrit was seen in 22 patients and an improvement in hematocrit was seen after volume replacement.

Platelet transfusion was required in four patients who had platelet <30,000 (Table 2). The RFT and liver function test (LFT) were normal.

Term delivery was in 19 (54%) patients and preterm delivery was in 6 (17%) patients, lost to follow up 5 (14%) patients, and abortions in 5 (15%) patients. Out of 25 deliveries, 13 (52%) were FTND and 12 (48%) were LSCS—no delivery was complicated by postpartum hemorrhage due to strict enforcement of active management of the third stage of labor (Table 3). Though studies have reported vertical transmission, in the present study, there were no cases of neonatal transmission. Perinatal outcomes were satisfactory for term gestations.

Discussion

The WHO criteria were strictly applied to define cases of DF. Our Study included 35 confirmed cases of DF, of which 2 patients developed DHF.

The mean age in the present study was 23.74 ± 3.5 years. A majority of the patients presented with classic constitutional symptoms: severe headache, vomiting, and myalgia. Most of them recovered with supportive management. Women with uncomplicated DF 33 (94%) had an uneventful hospital stay and was discharged. Two (6%) of the dengue seropositive women met the criteria for DHF. No mortality was noted.

Maternal Outcomes

The outcome of the study by Chitra and Panicker at Coimbatore was the severe thrombocytopenia (platelet count of <50,000 cell/mm^3)

which was seen in 78.5% of their women, of which two women had platelet counts <10,000 cell/mm^3. The fall in the platelet count was rapid and progressive.[9] The study by Kanakalatha et al. also found thrombocytopenia in 63/73 patients (86%), of which two patients had counts less than 20,000 cells/mm^3. In the present study as well, the platelet count was low (<1 lakh) in 21 patients, out of which transfusion was required in 4 patients who had platelet <30,000 cells/mm^3. The Kanakalatha et al. study showed nine patients (14.2%) with DF and both cases of DHF and single case of dengue shock syndrome (DSS) required platelet transfusion.[10]

Among the patients who presented with bleeding manifestations, two patients presented with epistaxis and petechial hemorrhages. Both these patients had platelet counts less than 30,000 cells/mm^3. This finding is in conjunction with the above-mentioned study by Kanakalatha et al.[10]

Most of our patients had a normal clinical presentation of acute DF; two of our patients had the signs and symptoms of DHF, with persistent thrombocytopenia, rising hematocrit, and fluid collection in the third space. Correction of fluid and electrolyte imbalance as well as multiple platelet transfusions was helpful, and the patient recovered after treatment.

Term delivery was in 19 (54%) patients and preterm delivery in 6 (17%) patients. Out of 25 deliveries, 13 (52%) were FTND and 12 (48%) were LSCS. Vaginal delivery was not complicated by postpartum hemorrhage due to active management of the third-stage of labor.

Fetal and Neonatal Outcomes

Data from other studies have shown an increase in the incidence of prematurity. A study conducted by Carles et al. studied 38 cases in French Guiana and show an increase in prematurity and fetal death.[11]

In our study, six patients (17%) had preterm labor comparable to that in the study by Kanakalatha et al. which had four (5.5%) patients who had preterm birth and four (5.5%) had preterm prelabour rupture of membranes (PPROM).[10] Among the six babies who were preterm and appeared to be having weight adequate for gestational age.

Fetomaternal Transmission

We observed no cases of vertical transmission rate. No babies were admitted to the neonatal intensive care unit (NICU).

Though evidences support vertical transmission, in present hospital, there were no cases reported of neonatal transmission. Perinatal outcomes were satisfactory.

Conclusion

The risk of perinatal transmission to the neonate is low if the mother is managed appropriately. Primary preventive measures such as use of mosquito repellents, nets, proper sanitation, and clothing are encouraged. Early detection of the critical phase, with appropriate fluid management, can decrease the mortality and morbidity associated with dengue infection. Pregnancies complicated by dengue infection will need around-the-clock monitoring in a tertiary care for potential fetal and maternal morbidity. The primary physician should consider dengue in the differential diagnosis of pregnant women with fever. However, immediate attention and medical assistance in the form of hydration and symptomatic management to the condition helped avoid deterioration of the patient to dengue hemorrhagic and dengue shock syndromes. Further studies are mandatory to improve evidence-based data in the management of dengue specific for pregnancy, are not formulated.

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