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Maternal and fetal complications of dengue fever in pregnancy

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Abstract
Purpose: To evaluate the feto-maternal complications of the dengue fever in pregnancy.
Method: A prospective study was performed to access the maternal, fetal and neonatal complications of dengue fever in a pregnant woman at RMC, Ajmer during the period from Jan.2021 to Nov. 2021.
Result: The striking features observed was the presence of thrombocytopenia in (90%) of the study population.
Conclusion: In our study, dengue was associated with high maternal and fetal morbidity. Dengue needs early diagnosis and prompt treatment to avoid its adverse outcomes.

Keywords: Pregnancy, Dengue, Dengue fever, Thrombocytopenia, HELLP

Introduction
The incidence of dengue has grown dramatically around the world in recent decades. A vast majority of cases are asymptomatic or mild and self- managed, and hence the actual numbers of dengue cases are under reported.one modelling estimate indicates 390 million dengue virus infections per year of which 96 million manifest clinically. The number of dengue cases reported to WHO increased over 8 fold over the last two decades.
Dengue is the most prevalent mosquito borne viral disease affecting humans. The causative agent is Dengue virus (DENV, Family- Flaviviridiae, Genus-Flavi-virus) an Aedes transmitted virus that occurs as four serotypes (DEN-1, DEN-2, DEN-3 and DEN-4). WHO revised their guideline in 2009.Dengue cases now classified as either dengue with or without warning signs present as acute febrile illness with at least two of the following – Nausea, vomiting, rashes, aches and pain, leukopenia and a positive tourniquet test. Warning sign are defined as abdominal pain, persistent vomiting, fluid accumulation, mucosal bleeding, lethargy, liver enlargement and increasing hematocrit.
Severe dengue is associated with plasma leakage, severe bleeding or organ failure. Literature suggest an increased risk of maternal hemorrhage, Preterm labor and Oligohydramnios.
Clinical presentation of dengue may be confused with HELLP syndrome; however, serology will help clinch the diagnosis.

Material and Method
This prospective study was conducted at the Tertiary care centre Rajkiya Mahila Chikitsalya, Ajmer. All pregnant women came in hospital irrespective of period of gestation with complaint of fever and were admitted for evaluation. As per protocol dengue PCR (NS1Ag) was done in all women. Out of 318, 60 were dengue positive. Dengue was diagnosed using NS1Ag AND IgM Serology. Analysis was done with respect to age of patients, gestational age of pregnancy, clinical presentation, laboratory diagnosis, platelet counts and treatment offered. Outcome of pregnancy were Abortion, preterm labor, low birth weight baby, IUD, term delivery, stillbirth, condition of fetus at birth noted.
Maternal consequences were Premature labor, Oligohydramnios, IUGR, Pre-eclampsia, eclampsia, Hemorrhage during labor, Retro placental hematoma noted.
Neonates were defined as premature if gestational age was less than 37 weeks and LBW if birth weight was less than 2500gms. Asphyxia was defined with APGAR score below 7 at the fifth minute of life.

Results

A total of 60 cases of pregnant women with dengue fever were identified. Majority of the women were in between 26-30 yrs. of age. The mean age of women was 26±4 years. Majority of patients were in second and third trimesters. Only 6 patients were found below 13 weeks of gestation. The mean gestational age at presentation was 28±8 weeks.4 women had platelet <10,000 cells/mm3 and all of them received platelet transfusions. Out of 60 patients, 33 had normal vaginal delivery, 21 underwent caesarian section.

Table 1: Distribution according to age

Age of the women (yrs.)	No. of pregnant women
<20	6(10%)
20-24	17(28.33%)
25-29	26(43.33%)
>30	11(18.33%)

Table 2: Gestational age at presentation

Gestational age at which dengue fever occurred (wks.)	No. of pregnant women
<13wks	6(10%)
13-27wks	14(23.33%)
28-36wks	18(30%)
>36wks	22(36.66%)

Table 3: Distribution according to platelet count

Platelet count on admission (cell/mm3)	No. of pregnant women
<10,000	4(6.66%)
10,000-25,000	12(20%)
25,000-50,000	20(33.33%)
50,000-1lakh	18(30%)
>1lakh	6(10%)

Table 4: Diagnostic testing of 60 pregnant women with dengue fever

NS1 Ag positive	Dengue lgM Antibody positive
At admission	
Number of women-44(73.33%)	16(26.66%)
At discharge	
Number of women- 12(20%)	48(80%)

Table 5: Maternal outcome of a pregnant women with dengue fever

Maternal outcome	Number of cases
Pre-eclampsia	12(20%)
Pre term labour	23(38.33%)
Labour outcome	
(a) Miscarriage	6(10%)
(b) Vaginal deliveries	33(55%)
(c) Caesarean deliveries	21(35%)
Indication of LSCS-	
(a) Meconium stained liquor	5(27.77%)
(b) Abruption	3(16.66%)
(c) Fetal distress	8(44.44%)
(d) Previous 2 LSCS	2(11.11%)
(e) Oligohydramnios	3 (14.28%)
Postpartum hemorrhage	13(24.07%)
Thrombocytopenia	54(90%)
Shock	3(5.55%)
Acute kidney injury	1(1.85%)
Acute respiratory distress syndrome	2(3.70%)
Maternal near miss	1(1.85%)

Table 6: Fetal and neonatal consequences of pregnant women

Fetal and neonatal consequences	No. of cases
Miscarriage	6(10%)
Oligohydramnios ultrasound	26(48.18%)
Fetal growth restriction	5(9.25%)
Stillbirth	8(14.81%)
Preterm babies	23(42.59%)
Low birth weight	14(25.92%)
Neonatal ICU admission	11(20.37%)
Ventilator requirement	7(12.96%)
Neonatal death	2(3.70%)

Discussion

A majority of women were unbooked and presented with classical symptoms of high-grade fever, myalgia, headache, and rashes. The mean age of women was 28±2 years. The mean gestational Age at presentation was 28±8 weeks.

Most women in our study were in third trimester of pregnancy at the time of diagnosis. This is similar to study done by Chitra *et al*. This is likely because physician manages women at early gestations and dengue, while at later gestation are managed by obstetricians due to labour.

Most of these women was severe thrombocytopenia (PLT count<50,000cell/mm3) which was seen in seen in 36 out of 60 women of which 6 women had platelet counts<10,000 cell/mm3. The fall in platelet count was rapid and progressive initially. Platelet transfusion was done only if the mother went into labour or had any bleeding tendencies or if she was posted for caesarian section. Symptomatic dengue infection may increase the risk of preterm labour.in our study 23 women had preterm delivery (38.33%). which is similar to study done by Basurko *et al*. (41%).

6 women had spontaneous abortion (10%) and 26(48.18%) pregnancies were complicated with oligohydramnios in present study compared to 52% rate of oligohydramnios from a study done in India by Agarwal *et al*. We found high incidences of post partum hemorrhage, due to dengue associated thrombocytopenia is a significant concern in pregnant women with reported rate of 2.2-30%. We found a post partum hemorrhage rate of 24.09%. Similar to study done by Basurko *et al*. There were 11 neonatal intensive care unit (NICU) admissions (20.37%), 8 still birth (14.81%) and 2 neonatal death (3.70%). Carles*et al*. also reported high fetal death rate. The rate of fetal adverse outcome in our study were 9.25% FGR, 42.59% preterm births, 25.92% low birth weight babies. Similar to study done by Paixao *et al*.

Our study has demonstrated adverse maternal outcomes for pregnant women with dengue, as 1.85% women had severe maternal outcomes (maternal near miss). Correlate with Ismail *et al*. In our study, there was no maternal death. Dengue infection causes activation of immune system to release of cytokines and chemokines, endothelial cell autophagy and T cell apoptosis; all of these factors lead to endothelial

Cell dysfunction, which in turn leads to plasma leakage, contraction of intravascular volume and third space fluid loss. Organ dysfunction in pregnant women with dengue requires vigilant monitoring and intensive management in ICU, to salvage such women.in our study, rate of caesarean deliveries was 35%. Correlate with study done by Chitra *et al*. we found postpartum hemorrhage, Shock, AKI, ARDS in our study.

Active management of third stage labor, I intensive monitoring and management, accompanied with blood and blood products transfusion is required to manage such cases.

Pregnant women with dengue fever should be considered for admission early because of its unpredictable course. Maintain normothermia and adequate hydration should be the goal. Low platelet counts should be taken as a marker of severity of the disease. Oligohydramnios is an ominous sigh when see concomitantly with dengue infection because the high fetal mortality was associated with it. The exact cause of oligohydramnios is not known but dehydration associated with dengue fever may be contributory. Hydration should be maintained by encouraging oral intake of oral rehydration solution (ORS), Fruit juice, and other fluids containing electrolytes and glucose for replacing losses from fever and associated vomiting. Dengue fever does not warrant any active obstetrical interventions.

Conclusion

The gestational age at presentation of dengue fever appeared to be significant. Early onset or late onset in pregnancy appeared to have a bad prognosis. A high index of clinical suspicion is essential in any pregnant women with fever during epidemics. Vector control methods should be employed during seasonal outbreaks. A wariness programs and medical education programs on the management of the dengue in pregnancy should be initiated especially during outbreaks to provide quality care. Conservative medical and obstetrical management is the treatment of choice.

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