

Dengue Fever in Pregnancy - Maternal and Fetal Outcome

F RAHMAN^a, DL HOSSAIN^b, S GANGULY^c, FNE TAWHIDA^d, LK NAHAR^e

Abstract:

Background and objectives: There has been a lot of concern related to dengue infection in pregnant women in recent years due to an increase in number of dengue infections worldwide. Dengue fever during pregnancy is associated with early pregnancy failure, preterm delivery, low birth weight babies, prematurity, and occasionally neonatal mortalities. The primary objective is to find out the maternal and fetal outcome of pregnancy affected by Dengue fever.

Materials and Method: This is a prospective observational study, conducted over a period of 3 months from 1st July to 30th September 2023 in Dhaka Medical College Hospital, Dhaka, Bangladesh.

Result: Out of the 44 pregnant patients admitted with suspected dengue infection, 56.8% were diagnosed serologically positive by NS1 and 43.2% by Dengue IgM. Fever was found in 100% patients and Thrombocytopenia

was found in 45.9% patients, PPH in 13.6%. Regarding obstetric management 25% got conservative management ,27.2% delivered vaginally and 38.6% undergone LSCS. About 25% pt needed to shift ICU in antenatal and postnatal period.4.5% were maternal mortality in this study period. On the other hand 13.7% were still born and 13.7% of the babies required NICU admission due to prematurity and low birth weight.

Conclusion: Dengue related complications are high in pregnancy. Timely and precise interventions in dengue infected pregnant women are needed for optimal outcome. Early detection and access to proper medical care in this specific group by multidisciplinary team can reduce complications and mortality.

Key word : Dengue , Pregnancy, Feto Maternal outcome

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Introduction:

Dengue fever is an acute mosquito-borne viral infections spread by *Aedes aegypti* (Diptera: Culicidae) mosquito. Dengue virus has 4 closely related serotypes of Flavivirus (RNA virus) transmitting to human being through vector. This virus is affecting wide range of populations, it is more common in children but Increasing incidence of dengue fever in adults, as well as in pregnant women¹. Early detection and access to proper medical care reduces fatality from 20% to below 1 % [2]. Treatment includes proper hydration, antipyretics and careful monitoring. 40% of world's population live in Dengue prone zone³. WHO estimates at least 100 million infection occur every year including 500,000 DHF cases and nearly 22000 deaths³. A

systemic meta-analysis in 2016 reveals an increased incidence of pre-term deliveries, low birth weight, pre-eclampsia, and caesarean sections⁴. Vertical transmission was also noted⁴. During the dengue epidemic in our hospital, we have managed many pregnant women with dengue fever. With this background, we analyzed pregnant women with dengue fever who were admitted in the obstetric department or referred from medicine department to obstetric department. We monitored the pt and determined the adverse effects of fever on mother during antenatal, intranatal or post-natal period of pregnancy and on the fetal outcome.

Materials & Method:

This was a hospital based prospective observational study , conducted over a period of 3 months from 1st July to 30th September, 2023 in Dhaka Medical College Hospital, Dhaka, Bangladesh. It includes all the pregnant women who had presented with clinical features suggestive of dengue fever were admitted and confirmed serologically positive (Dengue Ns1 or Dengue IgM) irrespective of gestational age, parity. Detailed history, examination and investigations were done at the time of diagnosis. Details management of the patients, need for platelet transfusion, obstetrics

1. Prof. Dr. Fatema Rahman, Professor OBGYN, DMCH
2. Dr. Dina Layla Hossain, Consultant OBGYN, DMCH
3. Prof. Dr. Shikha Ganguly HOD and Prof OBGYN, DMCH
4. Dr. Fazle Noor- E- Tawhida, Consultant OBGYN, DMCH
5. Dr. Layla Khayrun Nahar, IMO, OBGYN, DMCH

Address of Correspondence: Department of Obstetrics & Gynaecology, Dhaka Medical College Hospital, Dhaka, Bangladesh.

E-mail: pinkidr@live.com, +8801711336673

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outcome, ICU and NICU admission, were noted. Strict maternal and fetal surveillance were done to identify any complications at an early stage and prompt intervention was done. Follow up of these patients was continued up to 7 days of postpartum period.

Result:

A total of 44 cases of pregnant women with dengue fever were diagnosed by serological positive test. Clinical presentation and other laboratory investigations were noted. Age-wise incidence, gestational age at presentation, platelet count, Blood HCT and transfusion received, mode of deliveries, and associated maternal and neonatal complications are shown in Tables 1–8.

Table-I

Distribution of study population according to age

Age of the patient (yr)	No. of pregnant women	Percentage
<20	08	18.1
21 - 24	10	22.7
25 - 29	16	36.3
>30	10	22.7

Table-II

Gestational age at presentation

Gestational age at which DF occurred	No. of pregnant women	Percentage
<12 weeks	3	6.8
13 – 28 weeks	8	18.1
29 – 36 weeks	23	52.2
>37 weeks	10	22.7

Table-III

Serological report of study population

Serological test	No. of patients	Percentage
Dengue NS1	25	56.8
Dengue IgM	19	43.1

Table-IV

Obstetric management in study population

Obstetric management	No. of patients	Percentage
Conservative	11	25.0
Post Abortion Care	4	09.0
MVA	2	4.5
MRM	2	4.5
Vaginal delivery	12	27.2
LSCS	17	38.6

MVA – Manual Vacuum Aspiration ,
MRM – Menstrual Regulation by Medicine

Table-V

Hematological Complications in study population

Hematological Complication	No. of patients	Percentages
Platelet<1000000	20	45.4
HCT>36	08	18.1
WBC<4000	09	20.4

Table-VI

Maternal Complications in study population

Maternal Complications	No. of patients	Percentage
DIC	02	04.5
PPH	06	13.6
ICU shift	11	25.0
Maternal death	02	04.5

Table-VII

ICU requirement of study population

ICU shift	No. of patients	Percentage
Antenatal period	07	15.9
Dengue Shock Syndrome	04	9.0
Thrombocytopenia, <30,000	02	4.5
Hypoxia, Metabolic acidosis	01	2.2
Postnatal Period	04	09.9
PPH	02	4.9
DIC	02	4.9

Table-VIII

<i>Blood and blood product transfusion</i>		
Blood and Blood product transfusion	No. of patients	percentage
Whole blood / PCV	24	51.0
Platelet (concentrated/apheretic)	13	27.6
Fresh Frozen Plasma	14	29.7

Table-IX

<i>Neonatal outcome of study population</i>		
Neonatal outcome (total 29)	No. of patients	Percentage
Healthy Baby	14	48.2
Premature LBW	07	24.1
NICU transfer	04	13.7
Still birth	04	13.7

Discussion:

In current study, out of the 44 pregnant patients admitted with suspected dengue infections, 56.8% were confirmed by NS1 and 43.1% by Dengue IgM serologically. Majority (80%) of which were admitted through emergency in obstetric department and about 20% were referred from Medicine department. Age of patients ranged from 18-38 years, with majority (36.3%) were belongs age group 25 - 29 years corresponding to peak of reproductive age group which is similar to the study of Kanakalatha DH et al [5].

All patients were present with fever, temperature ranges from 100° F to 104° F. Study reveals that 74.9% of patients were affected in third trimester, while only 24.9% of cases were affected in first or second trimester. T.V. Chitra et al. also shows a similar gestational age distribution [6]. The gestational age at presentation of dengue fever appeared to be significant. Early onset or late onset in pregnancy had a bad prognosis. One woman presented at ten weeks of pregnancy who had spontaneous abortion one week later. The other two women were presenting at 14 wks and 16 wks of gestation respectively with per vaginal bleeding during admission and diagnosed as incomplete abortion. Both patients were managed by MVA. A pt presented with high grade fever, thrombocytopenia, leucopenia with missed abortion, managed in intensive care unit with transfusion of blood, platelet and FFP. Brar

R et al. shows 4.5% pregnancies suffered from miscarriages where our study showed 9% abortion occur in total pregnancy⁷. Dengue fever in pregnancy promote spontaneous abortion and preterm birth by inducing placental inflammation and trophoblast apoptosis, production of inflammatory cytokines and chemokines such as interleukin 6,8 and 18 resulting in heat shock protein interaction causing damage to placenta or fetus and stimulation of uterine contraction^{8,9}.

Our studies showed that 56.8% of cases were Dengue NS1 Ag positive while 43.1% were IgM positive. NS1 test detect non – structural protein NS1 of dengue virus in patient serum during acute phase of infection (0-7 days of symptoms). A negative NS1 test does not rule out infection; they should be further tested for the presence of IgM antibodies which appear approximately after five days of illness, followed by IgG which appears about 14 days post onset in primary infection. When IgG levels rise rapidly within 1-2 days of illness and IgM may not appear within 20 days of illness suggest secondary infections⁹.

In our study, 08.5% of cases had raised aspartate aminotransferase levels ranging 3 to 5 times the normal level was also observed by Chanana C et al [10] mistakenly diagnosed as HELLP syndrome. However, serology helped to confirm the diagnosis.

This study revealed that 24.1% of total cases had preterm delivery; 27.2% had term vaginal delivery and 38.6% underwent caesarian section due to fetal distress in first stage of labor and other Obstetric indication mainly P/H/O LSCS. Arti J. Patel et al. shows 36.6% had term delivery and 13.3% underwent caesarian¹¹. So, in comparison incidence of LSCS is more in our study.

About 25% of pregnancy were managed conservatively, means pt were discharged after confirming maternal and fetal wellbeing. The rest of the pt delivered vaginally or by LSCS.

Present study showed that with dengue infection during pregnancy, 24.1% neonatal outcome affected in the form of prematurity and low birth weight babies. Among 29 neonate 13.7% of neonates required NICU admission. Prematurity and low birth weight babies were found in cases where birth has occurred due to premature labour or fetal distress in maternal hyperpyrexia period (interval between day 1 and labor d¹⁵ days) due to maternal viraemia or vertical transmission of dengue virus¹¹.

In the present series, 42.5% of cases were having thrombocytopenia and 27.6% of cases required platelet transfusion which is 2.5 times more showing to the study of Kanakalatha DH et al [5]; suggesting of bone marrow hypoplasia. Post Partum Hemorrhage occurred in 12.7% cases and managed accordingly. In our study about 04.2% of patients developed DIC may be due to platelet depletion or massive hemorrhage or massive transfusion.

Conclusion:

Pregnant women acquiring dengue infections at any gestational age require close monitoring, Early diagnosis of complications and prompt management to improve fetomaternal outcome. Maintaining normothermia and adequate hydration by encouraging intake of oral rehydration liquid as well as intravenous fluids should be the goal in management. Awareness programs and medical education sessions should be conducted during seasonal outbreaks.

Conflict of Interest: None

Recommendations:

Study for longer duration of time as well as involving multiple centers can reveal more facts and informations relating to fetomaternal outcome with dengue infection during pregnancy.

pregnant women should stay indoors during peak mosquito activity, wear protective clothing, and use insect repellent on clothing and sparingly on skin prevention before acquiring disease.

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