Original Article

Fetomaternal Outcomes of Dengue Fever in Pregnant Patients at Lady Aitchison Hospital, KEMU, Lahore

Abida Sajid[1], Arham Sajid[2], Aqsam Sajid[3], Maham Ali[4], Javeria Fatima[5]

[1]Associate Professor, Obstetrics and Gynaecology, King Edward Medical University, Lahore
[2]4th Year MBBS student at Shalamar Medical and Dental College, Lahore,
[3]Post Graduate Resident in General Surgery at Sheikh Zaid Hospital Lahore, [4]Senior Registrar Radiology Shalamar Hospital,
[5]Post graduate resident MS Gynae& Obst at Lady Aitchison Hospital Lahore.

Correspondence: *Dr. Abida Sajid*
Associate Professor, Obstetrics and Gynaecology,
King Edward Medical University, Lahore
drsajidrafi@gmail.com

Abstract

Objective: To assess the feto-maternal outcomes in pregnant females infected with dengue fever.
Methodology: This prospective observational study design was conducted at Department of Gynae & Obstetric unit-5, Lady Aitchison Hospital KEMU, Lahore. 1ST November 2021 to 30th November 2023.
Seventy-two pregnant patients with fever were enrolled in the study after confirmation of dengue test positive either by NS-1 and IgM &IgG. Feto maternal outcomes were observed by following the patient during pregnancy, labor and in post-partum period.
Results: Mean age of the women was 25 ± 4.3 years. 69.5% were multipara and 30.5% were primigravida. Preterm labor was recorded in 43.05%, intrauterine death in 18.9%, fetal growth restriction in %. 22.8% delivered vaginally and 44.4% had caesarean section. PPH was observed in 24.43%, 4(5.5%) had obstetric hysterectomy and 4(5.5%) mothers were died due to severe dengue. Neonatal admission in NICU was 33.3%.
Conclusion: Dengue infection during pregnancy is associated with increased maternal and perinatal morbidity and mortality.
Keywords: Dengue Fever, Pregnancy, Maternal outcome, Fetal outcome Preterm delivery, still birth, Fetal growth restriction.

Cite this article as: Sajid A, Sajid A, Sajid A, Ali M, Fatima J. Fetomaternal Outcomes of Dengue Fever in Pregnant Patients at Lady Aitchison Hospital, KEMU, Lahore. J Soc Obstet Gynaecol Pak. 2024; 14(3):316-319.

Introduction

Dengue is the most prevalent viral vector borne disease worldwide, almost affecting 390 million people annually, of which 96 million show symptoms.[1] Dengue virus (DENV) is transmitted by female mosquitoes mainly of the species Aedes Aegypti and, to a lesser extent, Aedes albopictus.[2] As pregnancy is a decreased immune state of a female, the risk of Dengue Fever in pregnancy increases especially in highly endemic areas. There is an increased risk of preterm delivery, low birth weight, hemorrhage to both mother and fetus. Therefore, adequate rehydration therapy either by oral or intravenous route along with blood and blood products transfusion has shown to improve maternal outcome. [3]

Dengue in pregnancy adversely affects maternal and fetal outcomes with high maternal mortality of 15.9%. Preterm labor and postpartum hemorrhage can cause significant morbidity to the baby and mother. Because of such morbidity and mortality rates, vector control strategies should be implemented in affected areas.[4] Platelet count may fall rapidly but no active intervention is required unless patients are in labor or have bleeding disorder.[5]

Available literature reveals an increased incidence of preterm deliveries, low birth weight babies, pre-eclampsia and increased number of caesarean sections.[5,6] most of the studies had small sizes thus with the aim to enhance our knowledge of the clinical profile, maternal, and fetal outcome of dengue fever during pregnancy and to investigate these issues in greater detail, and with greater power to explore the

Authorship Contribution: [1]Substantial contributions to the conception or design of the work or the acquisition, Final approval of the version to be published [2,3,4] Drafting the work or revising it critically for important intellectual content, [5]Active participation in methodology.

Funding Source: none
Conflict of Interest: none

Received: May 13, 2024
Accepted: Sept 27, 2024

association between symptomatic dengue during pregnancy and maternal mortality, a descriptive observational study was carried out.[7]

A study done by Sondo KA, Quattara Adama et al revealed that there was early delivery in {12%} and post-partum hemorrhage in (20%).[8] Pregnant women infected with Dengue virus, premature birth was reported in about 10% of pregnancies, low birth weight in 18% of cases.[9]

Perinatal complications included six nursery admissions and one neonatal death in view of poor obstetric outcomes, this viral infection warrants early admission and prompt management.[10]

This aims to assess the maternal and fetal outcomes in pregnant patients with dengue fever at Lady Aitchison Hospital, Lahore. Early detection and management will reduce the mortality and morbidity associated with dengue fever in both mother and fetus.

Methodology

It is a prospective observational study carried out at Gynae unit 5, Lady Aitchison Hospital, King Edward Medical University Lahore, during the period of 1st November 2021 to 30th November 2023. Ethical approval was taken from Institutional Review Board no: 184/RC/KEMU dated 8th June 2023.

All pregnant women coming into the OPD, Emergency and Labor room with fever were screened for dengue. Women with symptoms of dengue and Laboratory Test positive for dengue- NS-1(non-structured protein), dengue IgM and IgG antibodies positive were enrolled for the study. Information gathered and entered in the proforma and Excel sheet. Symptoms of dengue may include fever, myalgia, arthralgia, headache, retro-orbital pain, nausea, vomiting and abdominal pain.

Dengue- related thrombocytopenia, HB%, TLC, raised ALT, AST were also recorded for analysis in results. Pregnant women outcomes were observed for miscarriages, preterm birth, fetal growth restriction, placental abruption, stillbirth, mode of delivery SVD/LSCS, postpartum hemorrhage (PPH), need for blood and platelets transfusions. Age, parity and duration of pregnancy were also recorded. Pregnant ladies with known cases of ITP, fever due to COVID-19, malaria, typhoid or other causes were excluded. Data was entered in EXCEL SHEET and analysis by SPSS- 26

Results

Total patients received with fever in pregnancy during the study period were 356, out of these 72 cases were diagnosed as dengue positive either with Non Structural Ag 1 (NS-1Ag) or dengue IgM and IgG test. The reported clinical presentations of patients were fever (92%), myalgia (55%), headache (67%), exanthem/rash (23%), nausea and vomiting in 28% and 18% respectively. Thrombocytopenia was observed in 31% of pregnant females infected with dengue. (Table I)

Table I: Clinical Presentation of Pregnant Patients with Dengue Fever.

Clinical Aspect/presentations	Frequency
Fever	92%
Myalgia	56%
Headache	67%
Exanthems	23%
Vomiting	18%
Nausea	17%
Conjunctivitis	15%
Arthritis	9.2%
Leucopenia	5.5%
Thrombocytopenia	31%
Retro-orbital pain	5.1%

The feto-maternal outcome was recorded as preterm delivery in 31(43%), term delivery 37(51.4%), fetal growth restriction in 16(20.3%), intrauterine death in 14(18.2%). As far as mode of delivery is concerned 17(20.9%) had vaginal birth and 32(44.4%) had LSCS. Postpartum hemorrhage occurred in 18(22.9%) managed with transfusion of blood and fresh frozen plasma. Platelet concentrate was transfused in those who had platelet count less 50,000/mm3. Four pregnant women infected with dengue ended up in obstetric hysterectomy. Fifteen infected women(20.8%) were admitted in ICU and four mothers out of 72 died. The frequency of neonatal admission in NICU was 33.3 %. [24]

Table II: Feto-Maternal Outcome of pregnant females with dengue.

Variables	Frequency
Preterm Delivery	43.05% (31)
Term Delivery	51.38 %(37)
Fetal growth restriction	22.22%(16)
Fetal distress	27% (20)
Intra uterine death	18.9% (14)
SVDs	22.9% (17)
LSCS	44.44%(32)
Miscarriages	5.4 %(4)
Ectopic pregnancy	5.4% (4)
Postpartum hemorrhage	24.43%(18)
Obstetric hysterectomy	5.5% (4)

Maternal admission to ICU	20.8%(15)
Neonatal admission to NICU	33.33% (24)
Maternal death	5.5% (4)

Mean age of the women was 25+-4.3years with an age range of 18-39 years. Majority of pregnant patients with dengue were multipara 50(69.5%) and 22 (30.5%) were primigravida. On analysis of results 4(5.5) were in their 1st trimester 4(5.5%) in 2nd trimester and 64(83.5%) were presented in the 3rd trimester. Majority of them had dengue NS-1 and dengue IgM and dengue IgG positive. (Table III)

Table III: Maternal Outcome of Dengue of Dengue Infected Pregnancy.

Age	18-39 years 25+-4.3years
Parity	
Primigravida	30,5% (22)
Multigravidae	69.5%(50)
Gestational Age	
1st Trimester	5.55%(4)
2nd Trimester	5.55%(4)
3rd Trimester	83.33(60)
Dengue serology	
Dengue IgM +VE	77%(55)
Dengue IgM –VE	23%(17)
Dengue IgG+ VE	89%(64)
Dengue IgG –VE	11%(8)
NS-1 Positive	54%(39)
NS-1 Negative	35%(25)
NS-1 Not Checked	11%(8)

Significant associations were observed between maternal conditions and adverse fetal outcomes. Neonatal death was particularly higher in mothers with a history of pre-eclampsia, HELLP syndrome, and intrahepatic cholestasis of pregnancy (ICP). Additionally, low birth weight, meconium-stained amniotic fluid, and low APGAR scores at 1 and 5 minutes were significantly linked to specific maternal histories. These associations underscore the heightened risks for fetal complications in pregnancies complicated by these maternal conditions. Further details, including statistical values and the strength of these associations, are summarized in Table II.

A significant median difference of total bilirubin level (p-value <0.001), SGPT (p-value <0.001), SGOT (p-value <0.001), ALP (p-value <0.001), and GGT (p-value <0.001) were observed. (Table III)

Discussion

Dengue fever and other infections can easily attack the pregnant ladies in any stage of pregnancy, as it is an immunosuppressant state and considered a risk factor for dengue.

In this study 72 pregnant females were found to be infected with dengue fever and most of the cases were received during the months of September, October and November (similar to a study at Burkino Fasso) regardless, cases were presented throughout the year.[2] Pregnant women with fever should be offered NS-1, IgM and IgG tests to differentiate it from malaria as both share similar symptoms. [2,3] Average age of the patients in our study was 25+-4.3 years, ranging from 18-39 years. The age of patients observed in our study was less than the study by Sondo KA and comparable to many studies in literature as the age of marriage and child bearing was different in various countries due to difference in sociocultural and development level.[2, 10]

As far as parity is concerned 30.5%(22) were primigravida and 69.5%(50) were multipara, this frequency was 40% and 60% according to study of Shoaib M and et al.[2,14] The age, parity and gestational age may vary in different studies.[4, 5, 6]

The duration of pregnancy at which dengue occurs will determine the type and extent of complications, if dengue fever occurs during the first trimester, there is an increased risk of abortion. If it occurs during the third trimester there will be an increased risk of low birth weight, preterm labor and vertical transmission.[2, 6, 14]

The frequency of Dengue infection in our study was 5.54 % in the first trimester, 5.55% in the second trimester and 88.89% in the third trimester, which is similar to the study in Burkino Faso and Colombia. However, some studies reported a higher frequency of infection in the first trimester which was 45.4%. Carles in French Guiana found 40.9% infection rate in second trimester.[2, 3, 4, 15]

Maternal and fetal outcomes of pregnant ladies suffering from dengue in our study were studied. There was preterm delivery in 43.05%,(24) term delivery in 51.38%(36), fetal growth restriction in 22%(16), fetal distress in 27%(20), intrauterine death in 19%.[14] patients. There was a high frequency of threatened preterm labor reported in a series of studies conducted in Malaysia (50%) and it was 55% in French Guiana.[2, 15]

Impaired placental circulation, endothelial damage and increased vascular permeability may be a contributing cause of IUD and growth restriction of fetus.[14] Early diagnosis of dengue infection and specific management especially in the third trimester can improve the outcome and could prevent the preterm labor and fetal growth restriction and intrauterine death.[2, 5, 6]

Among 64 pregnant women, 17(23.6) had vaginal birth and 32 (44.4%) had c-section. This rising cesarean section rate might be due to fetal distress and acute phase of infection, similar findings were reported in literature in various studies. A study carried out in Burkina Faso showed 50% c-section rate and 50% vaginal birth.[2] The remaining 15 cases (20.8%) were undelivered till the end of this study, 4 had miscarriages and 4 had ectopic pregnancy. Our results correlated with WHO reports about dengue and severe dengue.[6]

We observed post-partum hemorrhage in about 24.8%.[18] cases and 4 cases had obstetric hysterectomy due to PPH. Mothers with critical conditions admitted in ICU were 15(20.8%)and 4 (5.5%) maternal deaths were recorded in this study while in the study of Shoaib M et al, maternal admission in ICU was 32% and maternal mortality was 14%.[14] A systematic review and meta- analysis by Rathore SS reported that Dengue virus infection in pregnant women was associated with maternal mortality (OR 4.14[95% CI, 1.17-14.73]) and neonatal deaths (OR=3.03 [95% CI, 1.17-7.83]) compared with pregnant women without dengue.[16]

Perinatal complications reported by Sondo KA included 6 nursery admissions and one neonatal death in view of poor obstetric outcomes; this viral infection warrants early admission and prompt management.[2, 10]

Majority of pregnant patients admitted for clinical management in the third trimester and need multidisciplinary care in our study. Similar findings were observed by Chong V and Rathore SS.[11, 16] Early intervention and appropriate treatment plan for fluid balance and vigilant monitoring of the disease can improve the maternal and fetal outcomes. Vector control strategies will be implemented to improve the maternal and fetal morbidity and mortality.

Conclusion

Dengue fever in pregnancy is associated with untoward outcomes in terms of stillbirth, preterm delivery, fetal growth restriction, postpartum hemorrhage, maternal admission in ICU, maternal and neonatal mortality. So dengue fever during pregnancy will be considered at risk and requires specific management, early intervention and vigilant monitoring to avoid complications and better outcomes.

References

1. Brar R, Sikka P, Suri V, Singh MP, Suri V, Mohindra R, Biswal M. Maternal and fetal outcomes of dengue fever in pregnancy: a large prospective and descriptive observational study. Arch Gynecol Obstet. 2021 Jul;304(1):91-100. doi: 10.1007/s00404-020-05930-7.
2. Sondo KA, Ouattara A, Diendere EA, Diallo I, Zoungrana J, Zemane G, et al. Dengue infection during pregnancy in Burkina Faso: a cross-sectional study. *BMC Infect Dis.* 2019;19:997. doi: 10.1186/s12879-019-4587-x.
3. Tien Dat T, Kotani T, Yamamoto E, Shibata K, Moriyama Y, Tsuda H, et al. Dengue fever during pregnancy. *Nagoya J Med Sci.* 2018;80:241–247.
4. Machain-Williams C, Raga E, Baak-Baak CM, Kiem S, Blitvich BJ, Ramos C. Maternal, fetal, and neonatal outcomes in pregnant dengue patients in Mexico. *Biomed Res Int.* 2018;2018:9643083. doi: 10.1155/2018/9643083.
5. Paixao ES, Teixeira MG, Costa MCN, Rodrigues LC. Dengue during pregnancy and adverse fetal outcomes: a systemic review and meta-analysis. *Lancet Infect Dis.* 2016;16:857–865. doi: 10.1016/S1473-3099(16)00088-8.
6. World Health Organization. Dengue and Severe Dengue. 2021. [(accessed on 22 November 2021)]. Available online: https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue
7. Green LJ, Pullon R, Mackillop LH, Gerry S, Birks J, Salvi D, Davidson S, et al. Postpartum-Specific Vital Sign Reference Ranges. *Obstet. Gynecol.* 2021;137:295.
8. Mulyana R.S., Pangkahila E.S., Pemayun T.G.A. Maternal and Neonatal Outcomes during Dengue Infection Outbreak at a Tertiary National Hospital in Endemic Area of Indonesia. *Korean J. Fam. Med.* 2020;41:161–166. doi: 10.4082/kjfm.18.0154.
9. Singkibutr T, Wuttikonsammakit P, Chamnan P. Effects of Dengue Infection on Maternal and Neonatal Outcomes in Thai Pregnant Women: A Retrospective Cohort Study. *J. Med. Assoc. Thai.* 2020;103:155–162.
10. Feitoza HAC, Koifman S, Koifman RJ, Saraceni V. Dengue infection during pregnancy and adverse maternal, fetal, and infant health outcomes in Rio Branco, Acre State, Brazil, 2007-2012. Cad Saude Publica 2017;33:e00178915.
11. Chong V, Tan JZL, Arasoo VJT. Dengue in Pregnancy: A Southeast Asian Perspective. Trop Med Infect Dis. 2023 Jan 27;8(2):86. doi: 10.3390/tropicalmed8020086.
12. European Centre for Disease Prevention and Control Dengue Worldwide Overview. [(accessed on 3 October 2022)]. Available online: https://www.ecdc.europa.eu/en/dengue-monthly
13. Wiyono L, Rocha ICN, Cedeño TDD, Miranda AV, Lucero-Prisno Iii D.E. Dengue and COVID-19 infections in the ASEAN region: A concurrent outbreak of viral diseases. *Epidemiol. Health.* 2021;43:e2021070. doi: 10.4178/epih.e2021070.
14. Shoaib M, Tareen MS, Afridi U, Saifullha S. Maternal and Neonatal outcome in pregnant women with dengue. PJMHS Vol 15,No 11, Nov 2021 3161
15. Carles G, Talarmin A, Peneau C, Bertsch M. Dengue fever and pregnancy: a study of 38 cases in French Guiana. J Gynecol Obstet Biol Reprod (Paris) 2000;29:758-6
16. Rathore SS, Oberi S,Tlilliard J, Raja R, Ahmad N K Vishwakarma Y et al. Maternal and Fetal Neonatal Outcome of Dengue virus infection during pregnancy. 11th June 2022. httpp // doi. Org.10-1111/1mi.13783
17. Bhatt S, Gething PW, Brady OJ, Messina JP, Farlow AW, Moyes CL, e tal. The global distribution and burden of dengue. Nature. 2013 Apr 25;496(7446):504-7.
18. Brady OJ, Gething PW, Bhatt S, Messina JP, Brownstein JS, Hoen AG, et al., Refining the global spatial limits of dengue virus transmission by evidence-based consensus. *PLOS Neglected Tropical Diseases*, 2012. 6(8): e176