DOI: https://doi.org/10.54393/pjhs.v6i1.2742

PAKISTAN JOURNAL OF HEALTH SCIENCES
(LAHORE)
https://thejas.com.pk/index.php/pjhs
ISSN (E): 2790-9352, (P): 2790-9344
Volume 6, Issue 01 (January 2025)

Original Article

OPEN ACCESS

Impact of Dengue Fever on Pregnancy Outcomes: A Prospective Observational Study

Muhammad Zubair[1*], Saddiqa Azmat[2], Muhammad Khan Malik[3], Rida Ajmal Khan[4], Sadia Asghar[2] and Durre Shahwar[2]

[1]Department of Medicine, Niazi Medical and Dental College, Sargodha, Pakistan
[2]Department of Obstetrics/Gynaecology, Niazi Medical and Dental College, Sargodha, Pakistan
[3]Department of Medicine, Dr. Faisal Masood Teaching Hospital, Sargodha, Pakistan
[4]Department of Physiology, Abu Umara Medical and Dental College, Lahore, Pakistan

ARTICLE INFO

Keywords:
Pregnancy, Dengue Fever, Maternal outcome, Fetal outcome, Preterm delivery, Fetal growth restriction, Stillbirth

How to Cite:
Zubair, M., Azmat, S., Malik, M. K., Khan, R. A., Asghar, S., & Shahwar, D. (2025). Impact of Dengue Fever on Pregnancy Outcomes: A Prospective Observational Study: Impact of Dengue Fever on Pregnancy Outcomes . Pakistan Journal of Health Sciences, 6(1), 233-237. https://doi.org/10.54393/pjhs.v6i1.2742

Corresponding Author:
Muhammad Zubair
Department of Medicine, Niazi Medical and Dental College, Sargodha, Pakistan
dr_zubair201@yahoo.com

Received Date: 27th September, 2024
Acceptance Date: 19th January, 2025
Published Date: 31st January, 2025

ABSTRACT

Dengue in pregnancy has a profound negative impact on both maternal and fetal outcomes, leading to increased maternal and neonatal mortality. **Objective:** To evaluate the maternal and fetal outcomes in pregnant women affected by dengue fever. **Methods:** A prospective observational study was carried out at Niazi Welfare Foundation Teaching Hospital, Sargodha. Non probability convenient sampling technique was used to collect data from 36 pregnant women enrolled after confirming dengue infection through NS-1 and IgM/IgG tests. Maternal and fetal outcomes were monitored throughout pregnancy, labor, and the postpartum period. Data was analyzed using SPSS version 26.0 and presented in frequency and percentages. **Results:** Fetal complications observed in this study were, preterm delivery in 16 cases (44.4%), term delivery in 14 cases (39%), fetal growth restriction in 8 cases (22%), and intrauterine death in 6 cases (16.6%). Maternal outcomes included, postpartum hemorrhage in 6 cases (16.6%), 7 infected women (19.4%) were admitted to the ICU, and two mothers (5.5%) died. The frequency of neonatal admission to the NICU was 30.5%. **Conclusions:** Dengue infection in pregnancy is linked to heightened risk of maternal and perinatal morbidity and mortality. Timely clinical interventions are necessary to avoid devastating consequences.

INTRODUCTION

Dengue is a highly prevalent viral vector-borne disease globally, affecting nearly 390 million people annually, with approximately 96 million cases being symptomatic [1]. The dengue virus (DENV) is primarily transmitted by female mosquitoes of the Aedes aegypti species, Aedes albopictus play a secondary role in its transmission [2]. Pregnancy, being an immune-compromised state heightens the risk of dengue fever, particularly in highly endemic regions [3]. Dengue in pregnancy is associated with an increased risk of preterm delivery, low birth weight, and hemorrhage affecting both the mother and fetus [4]. However, timely and adequate rehydration therapy, administered either orally or intravenously, alongside blood and blood product transfusions, has been shown to significantly improve maternal outcomes [5]. Dengue during pregnancy has a profound negative impact on both maternal and fetal outcomes, with maternal mortality rates reaching as high as 15.9% [6]. Complications such as preterm labor and postpartum hemorrhage contribute significantly to maternal and neonatal morbidity [7]. To mitigate these risks, effective vector control strategies should be prioritized [8]. In dengue fever a rapid decline in platelet count is common, active intervention are necessary if the patient is in labor or experiencing a bleeding disorder [9]. Existing literature indicates a higher incidence of preterm deliveries, low birth weight infants,

DOI: https://doi.org/10.54393/pjhs.v6i1.2742

preeclampsia, and increased rates of cesarean sections in cases of dengue fever during pregnancy [10]. A study reported early delivery in 23.5% of cases and postpartum hemorrhage in 17.8% [11]. Among pregnant women infected with the dengue virus, premature birth occurred in approximately 10% of pregnancies, and low birth weight was observed in 18% of cases [12]. Perinatal complications included six neonatal intensive care unit admissions and one neonatal death [13]. Given these poor obstetric outcomes, early admission and prompt management of dengue in pregnancy are essential to mitigate risks [14]. To expand our understanding of the clinical profile, as well as maternal and fetal outcomes of dengue fever in pregnancy, and to investigate these issues in greater depth, a descriptive observational study was conducted.

This study aimed to evaluate the maternal and fetal outcomes of pregnant patients diagnosed with dengue fever.

METHODS

A prospective observational study was conducted at Niazi Welfare Foundation Teaching Hospital, Sargodha, from September 2023 to November 2024. Sample size for study was calculated on open Epi software based on Intrauterine fetal mortality (4%) from a previous research [16] at 95% confidence interval and 6.4% margin of error. Ethical approval for the study was obtained from the Institutional Review Board under approval number NM&DC-IRB-54 and Letter Ref No: IRB/NM&DC/586. A written informed consent was taken from all participants and they were informed about all the risk and benefits. Non probability consecutive sampling technique was used in this study. During study duration, all pregnant women presenting to the OPD, Emergency, and Labor Room with fever were screened for dengue. Those exhibiting dengue symptoms and testing positive through laboratory investigations for dengue NS1 (non-structural protein), IgM, or IgG antibodies were enrolled in the study. Relevant information was collected and documented in a structured Performa and Excel sheet. Symptoms of dengue including fever, myalgia, arthralgia, headache, retro-orbital pain, nausea, vomiting, and abdominal pain were recorded in Performa. Dengue-related parameters, including thrombocytopenia, hemoglobin levels (Hb%), total leukocyte count (TLC), and elevated ALT and AST levels, were recorded for analysis. Maternal outcomes observed included miscarriages, preterm birth, fetal growth restriction, placental abruption, stillbirth, mode of delivery (SVD/LSCS), postpartum hemorrhage (PPH), and the need for blood and platelet transfusions. Additional data such as age, parity, and gestational age were also documented. Pregnant women with known cases of ITP or fever caused by COVID-19, malaria, typhoid, or other infections were excluded from the study. Data were compiled in an Excel sheet and analyzed using SPSS version 26.0 and presented as frequency and percentage.

RESULTS

During the study period, a total of 36 pregnant women diagnosed as dengue positive through either Non-Structural Antigen 1 (NS-1 Ag) or dengue IgM and IgG tests were included. The mean age of the women was 24 ± 5.3 years, with an age range of 18 to 39 years. The majority of the pregnant patients with dengue were multiparous (24 cases) while 12 cases were primigravida. Regarding gestational age, 2 women (5.4%) were in their first trimester, 2 women (5.4%) were in the second trimester, and 32 women (86.4%) presented in the third trimester. The majority of the cases tested positive for dengue NS-1, IgM, and IgG (Table 1).

Table 1: Maternal Characteristics of Dengue Infected Pregnancy

Age	24 ± 5.3 (18-39) Years
Parity	
Primigravida	12 (33%)
Multigravida	24 (67%)
Gestational Age	
1st Trimester	2 (5.4%)
2nd Trimester	2 (5.4%)
3rd Trimester	32 (86.4%)
Dengue serology	
Dengue IgM +VE	27 (75%)
Dengue IgM -VE	9 (25%)
Dengue IgE +VE	31 (86%)
Dengue IgE -VE	5 (14%)
NS-1 Positive	19 (53%)
NS-1 Negative	12 (33.3%)
NS-1 Not Checked	5 (13.7%)

The clinical presentations in dengue patients included fever (92%), myalgia (53%), headache (69%), exanthem/rash (22%), nausea (25%), and vomiting (19.4%). Thrombocytopenia was observed in 30.5% of the pregnant women infected with dengue (Table 2).

Table 2: Clinical Manifestations of Dengue Fever in Pregnant Women

Clinical Manifestations	Frequency (%age)
Fever	33 (92%)
Myalgia	19 (53%)
Headache	25 (69%)
Exanthems	8 (22%)
Vomiting	7 (19.4%)
Nausea	9 (25%)
Conjunctivitis	5 (14%)
Arthritis	4 (11%)
Leucopenia	2 (5.5%)

DOI: https://doi.org/10.54393/pjhs.v6i1.2742

Thrombocytopenia	11 (30.5%)
Retro-orbital pain	2 (5.5%)

The feto-maternal outcomes recorded in the study were as follows: preterm delivery in 16 cases (44.4%), term delivery in 14 cases (39%), fetal growth restriction in 8 cases (22%), and intrauterine death in 6 cases (16.6%). Regarding the mode of delivery, 8 women (22%) had a vaginal birth, while 14 women (39%) underwent a cesarean section (LSCS). Postpartum hemorrhage occurred in 6 cases (16.6%), which was managed with blood transfusions and fresh frozen plasma. Platelet concentrate was administered to those with a platelet count below 50,000/mm^3. 1 pregnant woman with dengue underwent obstetric hysterectomy. Additionally, 7 infected women (19.4%) were admitted to the ICU, and two mothers (5.5%) died. The frequency of neonatal admission to the NICU was 30.5% (Table 3).

Table 3: Feto-Maternal Outcomes in Pregnant Women with Dengue

Variables	Frequency (%)
Preterm Delivery	16 (44.4%)
Term Delivery	14 (39%)
Fetal growth restriction	8 (22%)
Fetal distress	7 (19.4%)
Intra uterine death	16 (16.6%)
SVDs	8 (22%)
LSCS	14 (39%)
Miscarriages	2 (5.5 %)
Ectopic pregnancy	2 (5.5 %)
Postpartum hemorrhage	6 (16.6%)
Obstetric hysterectomy	1 (2.7%)
Maternal admission to ICU	7 (19.4%)
Neonatal admission to NICU	1 (30.5%)
Maternal death	2 (5.5%)

DISCUSSION

Dengue fever and other infections can easily affect pregnant women at any stage of pregnancy, as pregnancy is an immunosuppressive state, making it a significant risk factor for dengue. In this study, 36 pregnant females were diagnosed with dengue, average age of patients in current study was 24 ± 5.3 years, with a range from 18 to 39 years. This age range was lower than that observed in the study [15], but comparable to many studies in the literature, reflecting variations in the age of marriage and childbearing across different countries due to sociocultural and developmental factors. The period of dengue infection during pregnancy plays a crucial role in determining the type and severity of complications. If dengue fever occurs during the first trimester, there is an increased risk of abortion. In contrast, if dengue infection occurs in the third trimester, it is associated with a higher risk of low birth weight, preterm labor, and vertical transmission of the virus. In current study, the frequency of dengue infection was 5.4% in the first trimester, 5.4% in the second trimester, and 86.4% in the third trimester, which is consistent with previous studies [16]. However, some studies have reported a higher frequency of infection in the first trimester [17]. Additionally, another study found a 40.9% dengue infection rate in the second trimester [18]. In present study, the maternal and fetal outcomes of pregnant women suffering from dengue were examined. Preterm delivery occurred in 44.4% (16) of cases, term delivery in 39% (14), fetal growth restriction in 22% (8), fetal distress in 19.4% (7), and intrauterine death in 16.6% of patients. A high frequency of threatened preterm labor was also observed, with similar findings in other studies [19]. Impaired placental circulation, endothelial damage, and increased vascular permeability may contribute to intrauterine death (IUD) and fetal growth restriction. Early diagnosis of dengue infection, along with specific management, especially in the third trimester, can improve outcomes. Timely intervention may help prevent preterm labor, fetal growth restriction, and intrauterine death, ultimately improving maternal and fetal health. Among the 36 pregnant women in the study, 8 (22%) had a vaginal birth, and 14 (39%) underwent a cesarean section. The increased cesarean section rate may be attributed to fetal distress and the acute phase of infection, which aligns with findings from various studies in the literature [20]. In current study, postpartum hemorrhage (PPH) occurred in 16.6% of cases (6 women), with 1case requiring obstetric hysterectomy due to severe PPH. Critical conditions in mothers led to ICU admissions for 7 (19.4%) women, and 2 (5.4%) maternal deaths were recorded. In comparison, the study reported ICU admissions for 32% of mothers and a maternal mortality rate of 14% [16]. A systematic review and meta-analysis found that dengue virus infection in pregnant women was associated with increased maternal mortality and neonatal deaths when compared to pregnant women without dengue [21]. A research study reported perinatal complications, including six nursery admissions and one neonatal death [15], highlighting the need for early admission and prompt management due to poor obstetric outcomes. In current study, most pregnant patients required clinical management during the third trimester and benefited from multidisciplinary care. Similar observations were made in other studies [22]. Current study provides valuable insights for clinical implications because timely intervention along-with proper fluid management and careful monitoring of the disease can significantly enhance maternal and fetal outcomes in pregnancy. Implementation of vector control strategies is crucial to reduce maternal and fetal morbidity and mortality. This was a single center observational study.

DOI: https://doi.org/10.54393/pjhs.v6i1.2742

There is need for large scale studies in other regions to enhance generalizability.

CONCLUSIONS

Dengue fever during pregnancy is linked to adverse outcomes, including stillbirth, preterm delivery, fetal growth restriction, postpartum hemorrhage, maternal ICU admission, and increased maternal and neonatal mortality. Therefore, it is regarded as a high-risk condition requiring specialized management, timely intervention, and vigilant monitoring to prevent complications and achieve better outcomes. Emphasis on early detection and timely management is critical in reducing the morbidity and mortality associated with dengue fever for both mother and fetus.

Authors Contribution

Conceptualization: MZ
Methodology: MZ, RAK, DES
Formal analysis: SA, MKM, SA
Writing, review and editing: MKM

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

REFERENCES

[1] Manikandan S, Mathivanan A, Bora B, Hemaladkshmi P, Abhisubesh V, Poopathi S. A Review on Vector Borne Disease Transmission: Current Strategies of Mosquito Vector Control. Indian Journal of Entomology. 2023 Jun 1: 503-13. doi: 10.55446/IJE.2022.593.

[2] Powell JR. Mosquito-Borne Human Viral Diseases: Why Aedes Aegypti?. The American Journal of Tropical Medicine and Hygiene. 2018 Jun; 98(6): 1563. doi: 10.4269/ajtmh.17-0866.

[3] Mulik V, Dad N, Buhmaid S. Dengue in Pregnancy. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2021 Jun; 261: 205-10. doi: 10.1016/j.ejogrb.2021.04.035.

[4] Jatoi SA, Lakhan S, Rani N. Impact of Dengue Fever on Feto-Maternal Outcomes: A Retrospective Study. Journal of Pharmaceutical Negative Results. 2022 Dec: 4306-10. doi: 10.47750/pnr.2022.13.S09.536

[5] Tissera H, Wijewickrama A, Weeraman J, Ghouse A, Kaluarachchi A, Fernando L *et al.* Clinical Management of Dengue Infection in Pregnancy. Ceylon Medical Journal. 2020 Dec; 65(4). doi: 10.4038/cmj.v65i4.9275.

[6] Brar R, Sikka P, Suri V, Singh MP, Suri V, Mohindra R *et al.* Maternal and Fetal Outcomes of Dengue Fever in Pregnancy: A Large Prospective and Descriptive Observational Study. Archives of Gynecology and Obstetrics. 2021 Jul; 304: 91-100. doi: 10.1007/s00404-020-05930-7.

[7] Rahman F, Hossain DL, Ganguly S, Tawhida FN, Nahar LK. Dengue Fever in Pregnancy-Maternal and Fetal Outcome. Journal of Bangladesh College of Physicians and Surgeons. 2023 Nov 28: 21-4. doi: 10.3329/jbcps.v41i40.69678

[8] Wilson AL, Courtenay O, Kelly-Hope LA, Scott TW, Takken W, Torr SJ, Lindsay SW. The Importance of Vector Control for the Control and Elimination of Vector-Borne Diseases. Plos Neglected Tropical Diseases. 2020 Jan; 14(1): e0007831. doi: 10.1371/journal.pntd.0007831.

[9] Bhardwaj D, Chawla S, Sahoo I, Rathore P, Sharma A, Siddique N. Dengue in Pregnancy. Medical Journal of Dr. DY Patil University. 2020 May; 13(3): 264-7. doi: 10.4103/mjdrdypu.mjdrdypu_195_19.

[10] Srisawat N, Thisyakorn U, Ismail Z, Rafiq K, Gubler DJ, ADVA-ISNTD World Dengue Day Committee. World Dengue Day: A Call or Action. Plos Neglected Tropical Diseases. 2022 Aug; 16(8): e0010586. doi: 10.1371/journal.pntd.0010586.

[11] Garg R, Malhotra N, Pathak A, Singh D, Agrawal P, Gautam A. Maternal and Perinatal Outcome in Dengue Fever in Pregnancy in North India. Journal Of South Asian Federation of Obstetrics and Gynaecology. 2021 Nov; 13(6). doi: 10.5005/jp-journals-10006-1978.

[12] 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.

[13] Ginige S, Flower R, Viennet E. Neonatal Outcomes from Arboviruses in the Perinatal Period: A State-Of-The-Art Review. Pediatrics. 2021 Apr; 147(4). doi: 10.1542/peds.2020-009720.

[14] Chong V, Tan JZ, Arasoo VJ. Dengue in Pregnancy: A Southeast Asian Perspective. Tropical Medicine and Infectious Disease. 2023 Jan; 8(2): 86. doi: 10.3390/tropicalmed8020086.

[15] Sondo KA, Ouattara A, Diendere EA, Diallo I, Zoungrana J, Zemane G et al. Dengue Infection During Pregnancy in Burkina Faso: A Crosssectional Study. BMC Infect Dis. 2019; 19: 997. doi: 10.1186/s12879-019-4587-x.

[16] Shoaib MA, Sohail Tareen M, Afridi UZ, Saifullah SA. Maternal and Neonatal Outcomes in Pregnant

DOI: https://doi.org/10.54393/pjhs.v6i1.2742

Women with Dengue. Pak J Med Health Sci. 2021; 15: 3161-. doi: 10.53350/pjmhs2115113161.

[17] Mubashir M, Ahmed KS, Mubashir H, Quddusi A, Farooq A, Ahmed SI *et al.* Dengue and Malaria Infections in Pregnancy: Maternal, Fetal and Neonatal Outcomes at a Tertiary Care Hospital. Wiener klinische Wochenschrift. 2020 Apr; 132: 188-96. doi: 10.1007/s00508-019-01606-8.

[18] Nallaperuma OL, Senanayake HM, Godevithana JC. Adverse Outcomes and Associations of Dengue in Pregnancy–A Retrospective Cohort Study. medRxiv. 2024 Apr 10: 2024-04. doi: 10.1101/2024.04.07.24304931.

[19] Rathore SS, Oberoi S, Hilliard J, Raja R, Ahmed NK, Vishwakarma Y *et al.* Maternal and Foetal-Neonatal Outcomes of Dengue Virus Infection During Pregnancy. Tropical Medicine & International Health. 2022 Jul; 27(7): 619-29. doi: 10.1111/tmi.13783.

[20] Sagili H, Krishna RS, Dhodapkar R, Keepanasseril A. Maternal & Perinatal Outcome of Fever in Pregnancy in the Context of Dengue-A Retrospective Observational Study. Indian Journal of Medical Research. 2022 Oct 1; 156(4&5): 619-23. doi: 10.4103/ijmr.IJMR_414_20.

[21] Jahan I, Alam LC, Akter S. Dengue in Pregnancy a Systemic Review and Meta analysis of Maternal and Perinatal Outcomes. IAR Journal of Medicine and Surgery Research. 2024 Nov; 5(6): 41-9. doi: 10.70818/Iarjmsr.2024.v05i06.0143.

[22] Duarte G, Braga AR, Kreitchmann R, Menezes ML, Miranda AE, Travassos AG *et al.* Prevention, Diagnosis, and Treatment Protocol of Dengue During Pregnancy and the Postpartum Period. Revista Brasileira De Ginecologia E Obstetrícia. 2024 Jul; 46: e-rbgo73. oi: 10.61622/rbgo/2024rbgo73.