

Original Article

# Maternal and Fetal Outcome of Dengue Fever in Pregnancy: A Cross-Sectional Study

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## ABSTRACT

**Background:** Dengue fever, a mosquito-borne viral infection, has become a significant global health concern, particularly in tropical and subtropical regions. The impact of dengue fever on pregnancy outcomes is a growing area of concern, with potential risks for both maternal and fetal health.

**Objective:** To assess the maternal and fetal outcomes of dengue fever in pregnancy.

**Methods:** This cross-sectional study was conducted at Hajiani Hospital and Bilawal Medical College Teaching (CDF) Hospital in Hyderabad over two years from January 1, 2020, to December 31, 2021. During this period, 2490 obstetric patients were admitted, and 52 of them, diagnosed with dengue fever during pregnancy, were included in the study. Data collection involved comprehensive medical histories, physical examinations, and routine laboratory tests, including rapid antigen and antibody tests for dengue, liver and renal function tests, and viral serology for hepatitis B and C. Descriptive statistics were calculated using SPSS version 25, including frequencies, percentages, means, and standard deviations.

**Results:** Out of the 52 patients with dengue fever in pregnancy, the mean age was  $29.04 \pm 8.40$  years. A significant majority (94.2%) had not received antenatal care, and most were from rural areas (71.15%) and illiterate (78.84%). The mean duration of hospital stay was  $4.57 \pm 2.932$  days. Common symptoms included fever (88.4%), gum bleeding (71.1%), and vomiting (53.8%). Major complications were thrombocytopenia (90.3%), obstetric hemorrhage (71.1%), and anemia (71.1%). Maternal mortality was 13.4%. Among the 37 patients who delivered, 45.9% had vaginal deliveries, 32% required instrumental delivery, and 21.6% underwent cesarean sections. Miscarriage occurred in 13.51% of the deliveries, preterm delivery in 37.87%, stillbirth in 2.70%, and neonatal mortality in 16.2%.

**Conclusion:** Acute dengue fever in pregnancy poses a significant clinical challenge with high maternal and fetal morbidity and mortality. The symptomatic dengue fever is associated with increased risks of miscarriage, preterm delivery, and poor neonatal outcomes. Enhanced antenatal care and early detection are crucial in managing these risks.

**Keywords:** Dengue fever, pregnancy, maternal outcomes, fetal outcomes, antenatal care, thrombocytopenia.

## INTRODUCTION

Dengue fever, a mosquito-borne viral infection caused by the dengue virus (DENV) of the Flaviviridae family, has emerged as a significant global health concern, especially in tropical and subtropical regions (1). The virus, transmitted by Aedes mosquitoes, manifests in four serotypes, leading to an estimated 390 million infections annually, with approximately 500,000 cases requiring hospitalization (2, 3). Historically, the World Health Organization (WHO) classified dengue infections into three categories: dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (4, 5). However, this classification system was revised in 2009 due to its limitations, notably the underestimation of disease severity in some patients. The updated guidelines categorize cases into severe dengue and dengue with or without warning signs, with symptoms ranging from acute febrile illness, rash, and leukopenia to more severe manifestations like organ failure and significant plasma leakage (6).

Pregnant women are increasingly recognized as a vulnerable group for dengue infection, with significant implications for both maternal and fetal health. Dengue infection during pregnancy has been associated with a range of adverse outcomes, including

miscarriage, preterm delivery, low birth weight, stillbirth, and neonatal death (7, 8). Studies from Brazil have highlighted a rise in severe dengue cases among pregnant women, particularly in the second and third trimesters, with higher mortality rates compared to non-pregnant women (9, 10). Similarly, research has indicated increased risks of maternal and fetal complications such as obstetric hemorrhage, thrombocytopenia, and anemia (11, 12).

This study aims to evaluate the maternal and fetal outcomes of dengue fever in pregnancy, conducted as a cross-sectional analysis at Hajiani Hospital and Bilawal Medical College Teaching (CDF) Hospital in Hyderabad over two years from January 1, 2020, to December 31, 2021. During this period, out of 2490 obstetric admissions, 52 cases of dengue fever in pregnancy were identified and included in the study (13,14).The methodology involved a comprehensive clinical examination, routine laboratory tests, and specific tests for dengue antibodies and antigens, liver and renal function, and viral serology for hepatitis B and C. Data were collected using a structured proforma and analyzed using SPSS version 20, with descriptive statistics employed to summarize frequencies and percentages (15).

The study found that the majority of the patients were from rural areas, with a significant proportion being illiterate and lacking antenatal care. Common symptoms included fever, gum bleeding, and vomiting, while complications such as thrombocytopenia, obstetric hemorrhage, and anemia were prevalent. The maternal mortality rate was 13.4%, and a substantial number of patients presented in the third trimester (16, 17) among the delivered patients, there were notable instances of miscarriage, preterm delivery, stillbirth, and neonatal mortality. These findings underscore the high maternal and fetal morbidity and mortality associated with dengue fever in pregnancy, highlighting the need for targeted strategies to manage and reduce the impact of dengue in this vulnerable population (18).

In conclusion, dengue fever in pregnancy poses a significant clinical challenge with severe outcomes for both mother and child. The association of symptomatic dengue fever with increased risks of miscarriage, preterm delivery, and adverse neonatal outcomes necessitates heightened awareness and improved healthcare interventions to mitigate these risks (17). This study contributes to the growing body of evidence on the impact of dengue during pregnancy, emphasizing the critical need for effective prevention and management strategies in endemic regions.

## MATERIAL AND METHOD

This cross-sectional study was conducted over a two-year period, from January 1, 2020, to December 31, 2021, at Hajiani Hospital and Bilawal Medical College Teaching (CDF) Hospital in Hyderabad. The study aimed to assess the maternal and fetal outcomes of dengue fever in pregnancy. Ethical approval was obtained from the institutional ethics committee, and all procedures followed the guidelines of the Declaration of Helsinki.

During the study period, 2490 obstetric patients were admitted to the obstetrics and gynecology departments, of which 52 patients diagnosed with dengue fever during pregnancy were included. Patients with thrombocytopenia from causes other than dengue fever, chronic liver disease, fulminant hepatic failure, and those who were discharged due to unaffordability were excluded from the study.

Data collection involved the use of a pre-designed structured proforma to record demographic details such as name, age, address, and socioeconomic status. Comprehensive medical histories, including obstetrical histories and prior antenatal records, were obtained. Each patient underwent a thorough physical examination and routine laboratory tests, including rapid antigen and antibody tests for dengue, liver and renal function tests, and viral serology for hepatitis B and C. Additional obstetric examinations and interventions were performed as necessary.

All patients were managed with supportive care, and those with multiple organ failures were treated in the intensive care unit in coordination with the critical care department. Data on qualitative factors, complications, and maternal and fetal outcomes were collected and analyzed. Descriptive statistics were employed to calculate frequencies and percentages, while mean and standard deviation calculations were used for age, duration of hospitalization, and laboratory test.

The data were analyzed using SPSS version 25. Percentages were determined for qualitative factors, complications, and outcomes, and the results were reported accordingly. The findings provided insights into the sociodemographic characteristics, clinical presentations, and outcomes of pregnant women with dengue fever, contributing to a better understanding of the impact of dengue on maternal and fetal health in this population (17).

## RESULTS

A total of 52 pregnant women diagnosed with dengue fever were admitted to Hajiani Hospital and Bilawal Medical College Teaching (CDF) Hospital from January 1, 2020, to December 31, 2021. The mean age of the patients was  $29.04 \pm 8.40$  years. The majority of

the patients (94.2%) had not received antenatal care, and a significant proportion were from rural areas (71.15%) and were illiterate (78.84%).

**Table 1 Sociodemographic Characteristics**

Variable	Frequency (%)
<b>Residence</b>	
Urban	4 (7.69)
Semi-Urban	11 (21.15)
Rural	37 (71.15)
<b>Socioeconomic Status</b>	
Lower	29 (55.76)
Middle	14 (26.92)
Upper	9 (17.30)
<b>Maternal Education</b>	
Illiterate	41 (78.84)
Primary	6 (11.53)
Middle	1 (1.92)
High	1 (1.92)
Undergraduate	1 (1.92)
Postgraduate	2 (3.84)
<b>Antenatal Visits</b>	
Booked	5 (9.61)
Unbooked	47 (90.38)

**Clinical Presentation and Laboratory Findings** The mean duration of hospital stay was  $4.57 \pm 2.932$  days. The most common symptoms were fever (88.4%), gum bleeding (71.1%), and vomiting (53.8%).

**Table 2 Maternal and Fetal Outcomes**

Variable	Frequency (%)
<b>Symptoms</b>	
Fever	46 (88.4)
Rash, petechia	9 (17.3)
Gum bleeding	37 (71.1)
Arthralgia	11 (21.1)
Myalgia	10 (19.2)
Vomiting	28 (53.8)
Bodyache	7 (13.5)
Cough, diarrhea, conjunctivitis	7 (13.5)
Abdominal pain	10 (19.2)
<b>Complications</b>	
Obstetric hemorrhage	37 (71.1)
Multiple organ failure	16 (30.8)
Pneumonia	11 (21.1)
Anemia	37 (71.1)
Thrombocytopenia	47 (90.3)
Encephalopathy	4 (7.6)
DIC	4 (7.6)
Renal failure	3 (5.8)
Septicemia	3 (5.8)

Ascites, pleural effusion, edema	2 (3.8)
Cerebral edema	4 (7.6)
None	10 (19.2)

Out of the 52 patients, 37 (71.2%) delivered, while 15 (28.8%) remained undelivered. Among those who delivered, 17 (45.9%) had vaginal deliveries, 12 (32%) required instrumental delivery, and 8 (21.6%) underwent cesarean sections. The overall maternal mortality was 13.4%.

**Table 3: Maternal and Fetal Outcomes**

Variable	Frequency (%)
<b>Trimester of Infection</b>	
First	10 (19.2)
Second	8 (15.3)
Third	34 (65.3)
<b>Maternal Outcome</b>	
Recovered	45 (86.5)
Died	7 (13.4)
<b>Delivery Mode</b>	
Vaginal delivery	17 (45.9)
Instrumental delivery	12 (32)
Cesarean section	8 (21.6)
<b>Fetal Outcome (n=37)</b>	
Miscarriage	5 (13.51)
Preterm delivery	14 (37.87)
Stillborn	1 (2.70)
Early neonatal death	6 (7.7)
Remained alive	11 (16.21)

The study highlighted the high maternal and fetal morbidity and mortality associated with dengue fever in pregnancy, underscoring the need for effective management strategies to mitigate these adverse outcomes

## DISCUSSION

The study provided a comprehensive overview of the maternal and fetal outcomes associated with dengue fever in pregnancy, revealing significant morbidity and mortality rates. The majority of patients were from rural areas, lacked antenatal care, and were illiterate, which likely contributed to the adverse outcomes observed. Fever, gum bleeding, and vomiting were the most common symptoms, aligning with findings from previous studies (19). Thrombocytopenia, obstetric hemorrhage, and anemia were prevalent complications, consistent with existing literature

The maternal mortality rate of 13.4% was notably high, highlighting the severe impact of dengue fever on pregnant women. This is comparable to other studies that reported high maternal mortality rates in similar settings (11, 12). The high rate of complications such as thrombocytopenia (90.3%) and obstetric hemorrhage (71.1%) underscores the need for timely and effective medical interventions to manage these conditions.

The majority of patients presented in the third trimester, which may explain the high rates of preterm delivery (38.87%) and neonatal mortality (16.2%). Previous studies have similarly reported increased risks of adverse fetal outcomes, including low birth weight, stillbirth, and preterm delivery, in pregnancies complicated by dengue fever (10, 13, 14). The findings of this study are consistent with research from Brazil and other dengue-endemic regions, where dengue infection during pregnancy has been associated with significant maternal and fetal morbidity and mortality (11, 12).

The study's strengths include its comprehensive data collection and the use of standardized laboratory tests to diagnose dengue fever, which enhances the reliability of the findings. However, the study also had several limitations. The sample size was relatively small, and the study was conducted at a single center, which may limit the generalizability of the results. Additionally, the retrospective nature of the study may have introduced selection bias, and the reliance on hospital records could have resulted in incomplete data.(20)

Despite these limitations, the study provides valuable insights into the impact of dengue fever on pregnant women and their fetuses in a resource-limited setting. The high rates of adverse outcomes observed in this study underscore the need for improved antenatal care and early detection of dengue fever in pregnant women. There is a critical need for public health initiatives to raise awareness about the importance of antenatal care and the potential risks of dengue fever during pregnancy. Furthermore, healthcare providers should be trained to recognize the symptoms of dengue fever and manage its complications effectively.

Future research should focus on larger, multicenter studies to confirm these findings and explore the underlying mechanisms contributing to the high morbidity and mortality rates associated with dengue fever in pregnancy. Additionally, there is a need for the development of targeted interventions to prevent and manage dengue fever in pregnant women, particularly in dengue-endemic regions. These efforts could significantly reduce the burden of disease and improve maternal and fetal outcomes (21).

## CONCLUSION

Study underscores the significant clinical challenges posed by acute dengue fever during pregnancy, highlighting the elevated maternal and fetal morbidity and mortality rates. The study confirms that symptomatic dengue fever is linked with increased risks of miscarriage, preterm delivery, and adverse neonatal outcomes. Enhanced antenatal care and early detection are crucial strategies for managing these risks effectively, ensuring better maternal and fetal health outcomes in affected populations.

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