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MATERNAL AND FOETAL OUTCOMES IN DENGUE-SEROLOGY POSITIVE PREGNANCIES FROM A TERTIARY CARE CENTRE IN SOUTHERN INDIA

Obstetrics & Gynaecology

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ABSTRACT

Background: Dengue fever is one of the most prevalent vector-borne viral infections in India and poses unique challenges during pregnancy due to potential risks of maternal and foetal complications. Physiological haemodilution, immune modulation, and altered coagulation in pregnancy may influence disease course and outcomes. This study was undertaken to assess the maternal and perinatal outcomes in dengue-positive pregnancies and compare them with dengue-negative cases. **Objectives:** To evaluate the demographic profile, clinical characteristics, and maternal and fetal outcomes in dengue-positive pregnant women and to compare these findings with those of dengue-negative controls.**Materials and Methods:** This cross-sectional prospective observational study was conducted at a tertiary care centre in South India among pregnant women admitted with febrile illness. A total of 45 antenatal patients were enrolled during the study period. Dengue infection was confirmed using NS1 antigen and/or IgM serology. Among them, 33 women tested positive for dengue, while the remaining were excluded due to other diagnoses; two patients were lost to follow-up, resulting in 31 cases included for final analysis. Data regarding maternal age, gravidity, gestational age, mode of delivery, maternal complications, and neonatal outcomes were collected. Statistical analysis was performed using Chi-square and Mann–Whitney U tests, with significance set at $p < 0.05$.**Results:** Among 45 antenatal febrile patients, 33 (73.3%) were dengue-positive. The mean maternal age was 25.2 ± 3.2 years in the dengue-positive group and 25.0 ± 4.4 years in the dengue-negative group ($p > 0.05$). Term delivery occurred in the majority of dengue-positive women, with preterm birth observed in a smaller proportion. The mean gestational age and birth weight were comparable between groups ($p > 0.05$). There were no cases of maternal mortality, stillbirth, or neonatal death, and ICU admission was required for only one dengue-positive mother. **Conclusion:** Dengue infection in pregnancy, in early trimesters when managed with supportive care, does not significantly impact obstetric or perinatal outcomes. Early screening, multidisciplinary management, and vigilant foetal surveillance are vital for achieving favourable results.

KEYWORDS

Dengue in pregnancy, maternal outcome, perinatal outcome, preterm labour, birth weight, tertiary care centre

INTRODUCTION

Dengue fever, a mosquito-borne viral disease caused by four serotypes of the dengue virus (DENV-1 to DENV-4) which the most important arbovirus.[1] It has emerged as one of the most significant public health threats globally, particularly in tropical and subtropical regions.[2] Recent estimates suggest that 50–100 million new infections occur each year, with almost half the world's population living in areas where dengue is endemic.[3] Of these, approximately 500,000 cases progress to severe forms such as dengue haemorrhagic fever (DHF) or dengue shock syndrome (DSS), resulting in about 22,000 deaths annually.[4]

The disease is mainly transmitted by the Aedes aegypti mosquito, and increasing urbanization, climate change, and population mobility have contributed to the expanding geographic distribution and frequency of outbreaks. The clinical presentation of dengue infection is highly variable, ranging from asymptomatic or mild febrile illness to severe and potentially fatal complications such as DHF and DSS.[5] Immunity following infection with a single serotype is lifelong for that serotype; however, subsequent infection with a different serotype increases the risk of developing severe disease due to immunological mechanisms such as antibody-dependent enhancement.[3] The incubation period typically ranges from 3–8 days, with viraemia detectable just before and during the initial febrile phase.[5] The acute phase commonly features fever, headaches, severe muscle and joint pain, retro-orbital pain, and sometimes a fine petechial rash, with the disease occasionally progressing to hemorrhagic manifestations and shock.[4,5]

In India, dengue fever poses a persistent and escalating public health problem, with frequent epidemics causing significant morbidity and strain on healthcare resources. The expansion of endemic areas and increased incidence have heightened the risk for all population groups, including pregnant women. Dengue infection during pregnancy presents several unique challenges: altered maternal immune responses, diagnostic dilemmas due to overlapping symptoms with obstetric complications, and increased risk of adverse maternal and neonatal outcomes such as preterm delivery, low birth weight, pre-eclampsia, caesarean section, intrauterine fetal death, and, less commonly, vertical transmission leading to neonatal dengue.[2,3] Recent regional data from Karnataka, for instance, highlight the growing burden, but systematic studies remain sparse, and the true prevalence of dengue in pregnancy is likely underestimated due to underreporting and the variable clinical spectrum.[6]

Despite this, there are no universally accepted international guidelines for the management of dengue infection in pregnancy, and clinical decision-making can be complicated by co-morbidities common in endemic regions, such as malaria, typhoid, and pre-existing maternal conditions. These challenges often result in both medical and ethical dilemmas, with the need to balance optimal maternal and foetal outcomes in a context of limited data and evolving disease dynamics. Given the increasing incidence and the unique risks associated with dengue in pregnancy, this retrospective study aims to evaluate and document the maternal and foetal outcomes associated with serologically confirmed dengue infection during pregnancy.

The objective is to raise clinical awareness, highlight the potential for adverse outcomes—including vertical transmission—and provide evidence to guide risk anticipation and management strategies in endemic areas.

AIMS & OBJECTIVES

The aim is to assess the clinical profile and maternal foetal outcomes among pregnant women diagnosed with dengue infection in a tertiary care centre.

Specific objectives-

Primary objectives

1) To describe the sociodemographic and obstetric characteristics of pregnant women affected by dengue infection.
2) To evaluate the clinical presentation and laboratory findings of dengue in pregnancy.

Secondary objective

1) To analyse the maternal outcomes, including complications, mode of delivery and mortality.
2) To assess foetal and neonatal outcomes such a s birth weight, APGAR score, NICU admission, and perinatal mortality.
3) To determine the association between disease severity and adverse pregnancy outcomes.

MATERIALS AND METHODS

Study design and setting

This study is a cross-sectional prospective observational study conducted on obstetrics patients admitted to tertiary care hospital at

Bengaluru rural for a period of 24 months (December 2023- December 2025) with dengue or related febrile illness over several months, as documented in the hospital's admission records and clinical databases. Pregnant women were included in the study regardless of their gestational age at the time of contracting the disease. They were followed up till delivery, and the newborn were also followed up post delivery for their outcomes. Informed consent was obtained, and a structured proforma was used to collect maternal and neonatal data on the effects of the disease during the antenatal, intrapartum and postpartum period.

Study participants and inclusion criteria

The study included pregnant patients with suspected or confirmed dengue infection, as identified using the hospital serials and IP numbers in the provided dataset. Inclusion criteria involved:

1) Admitted obstetrics patients (both booked and unbooked cases)
2) Laboratory evidence or clinical suspicion of dengue (NS1Ag, IgM, IgG status)
3) Rural and urban patients from varying months of admission.

Exclusion criteria

Women with other concomitant infections (e.g., malaria, leptospirosis, typhoid) Women with pre-existing medical disorders that influence outcomes (e.g., chronic hypertension, diabetes mellitus).

Data collection and variables

Data were extracted using a standardised data collection form based on electronic medical records and clinical documentation. The following variables were recorded:

1) Demographics: serial numbers, IP number, name, age, residence (rural/urban)

2) Obstetrics history: booking status, obstetric index (parity, gestational age) , mode of delivery, scar uterus.

3) Clinical details: provisional and final diagnosis , NS1Ag/ IgM/ IgG results, thrombocytopenia, platelet trend, PT, APTT, INR, presence of cardiac or diabetic comorbidities, ICU admission, need for cardiorespiratory support.

4) Outcomes: total hospital stay, foetal outcomes (birth weight, gestational age at birth, APGAR scores, NICU admission/ duration, hyperbilirubinemia, SGA/AGA/LGA status, bleeding manifestations).

Ethical considerations

Patient confidentiality was maintained by anonymizing direct identifiers such as names for study reporting, with ethical approval obtained from the institutional review board before data access and analysis.

Statistical analysis

Data were compiled in the Microsoft Excel and analyzed for descriptive statistics, including frequencies, means, and clinical outcome correlations. Categorical data (eg., ICU admissions, bleeding manifestations) and continuous data (e.g., platelets count, hospital stay durations) were summarized. Comparative analyses between groups (such as rural vs. urban, mode of delivery, dengue severity) were performed using appropriate statistical methods. Descriptive statistics were used for baseline characteristics, while inferential tests (Chi-square, t- test, or ANOVA) were applied to determine associations between disease severity and outcome. A p value < 0.05 was considered statistically significant.

RESULTS

Table 1- Baseline characteristics of the study participants (n=33)

Characteristics	Groups	Frequency (n)	Percentage (%)
Age (years)	<20	4	12.1
	21-30	24	72.7
	31-40	5	15.2
Parity	Primigravida	14	42.4
	Multigravida	19	57.6
Antenatal care status	Booked	21	63.6
	Referred	11	33.3
	Unbooked	1	3.1
Residence	Rural	29	87.9
	Urban	4	12.1
Gestational age(weeks)	<28	2	6.1
	28-37	22	66.7
	>37	9	27.2
Mode of admission	Routine	10	30.3
	Emergency	23	69.7

Table 2 : Clinical and laboratory profile on admission

Characteristics	Groups	Frequency (n)	Percentage (%)
Clinical severity	Dengue fever	30	90.9
	Dengue with bleeding	2	6.1
	Severe dengue (ICU)	1	3.0
Platelet count(cells/mm3)	>1.5 lakh	8	24.2
	1-1.5 lakh	7	21.2
	50,000- 1 lakh	9	27.3
	<50,000	9	27.3
Blood transfusion required	Yes	7	21.2
	No	26	78.8

Table 3: Obstetric details and perinatal outcome

Characteristics	Frequency (n)	Percentage (%)
Cesarean section	14	45.16
Vaginal delivery	17	54.83
Preterm birth	2	6.45
Term birth	29	93.54
Low birth weight	3	9.67
NICU admission	3	9.67
Still births	0	0
Live births	31	100

RESULTS

In the present study comprising 45 antenatal patients, 33 (73.3%) were serologically confirmed as dengue-positive. The mean maternal age among dengue-positive patients was 25.2 ± 3.2 years. Most women were multigravida, and infections occurred predominantly in the third trimester of pregnancy.

The majority of women were in the 21–30 years age group (72.7%), followed by 31–40 years (15.2%) and <20 years (12.1%). Multigravida constituted 57.6% of the study population, while 42.4% were primigravida. Most participants were booked cases (63.6%), whereas 33.3% were referred, and 3.1% were un-booked. Prominent demographic distribution was of women belonging to rural areas (87.9%).

At presentation, 66.7% were between 28–37 weeks of gestation, 27.2% were beyond 37 weeks, and 6.1% were below 28 weeks. Emergency admissions accounted for 69.7% of cases. Baseline characteristics are summarized in Table 1.

Clinically, 90.9% of patients had uncomplicated dengue fever, while 6.1% presented with dengue with bleeding manifestations, and 3.0% developed severe dengue requiring ICU admission.

Thrombocytopenia was observed across varying degrees: platelet count <50,000/mm³ in 27.3%, 50,000–1 lakh/mm³ in 27.3%, 1–1.5 lakh/mm³ in 21.2%, and >1.5 lakh/mm³ in 24.2% of patients. Blood transfusion was required in 21.2%, while the remaining 78.8% were managed conservatively. These findings are detailed in Table 2.

Regarding obstetric outcomes, 54.83% of women delivered vaginally, and 45.16% underwent cesarean section. Preterm delivery occurred in 6.45%, while 93.54% delivered at term.

Among neonates, 9.67% had low birth weight, and 9.67% required NICU admission. No stillbirths were recorded, and all delivered infants were live births. Obstetric and perinatal outcomes are presented in Table 3.

Regarding perinatal outcome, NICU admission was required in 3 neonates among dengue-positive cases. Fetal outcomes such as live birth on the mother's side, normal Apgar scores, and overall neonatal survival were similar between the groups. No maternal deaths occurred in our study.

DISCUSSION

Dengue fever is an important vector-borne disease in tropical countries such as India, with a rising incidence in recent years. Pregnancy complicated by dengue infection poses unique clinical challenges due to physiological haemodilution, thrombocytopenia, and the potential for maternal and foetal complications.

In the present prospective cross-sectional study of 33 pregnant women with confirmed dengue infection, the majority of affected women belonged to the 21–30-year age group (72.7%), which corresponds to the peak reproductive period. This demographic trend is comparable with findings reported by Sharma et al. (2019) and Waduge et al. (2006), who observed that dengue infection predominantly affected young pregnant women. A higher proportion of cases were observed among multigravida women (57.6%), similar to observations by Brar et al. (2015) and Thiyagalingam et al. (2013).

Most women in our study belonged to rural areas (87.9%), which may reflect increased mosquito breeding sites and limited access to preventive measures, as also reported in previous Indian studies.

The majority of patients presented during the late second and third trimesters, with 66.7% between 28–37 weeks and 27.2% beyond 37 weeks of gestation. Similar trimester predominance has been reported by Brar et al. (2015) and Thiyagalingam et al. (2013), who noted that most dengue infections in pregnancy were diagnosed during advanced gestation.

Clinically, most patients in our study had uncomplicated dengue fever (90.9%), while 6.1% developed bleeding manifestations and only 3.0% progressed to severe dengue requiring ICU admission. These findings are consistent with those of Agrawal et al. (2014), who reported that the majority of dengue infections during pregnancy follow a mild to moderate clinical course when managed appropriately.

Thrombocytopenia was a prominent laboratory abnormality in the present study, with 54.6% of patients having platelet counts below 1 lakh/mm³ and 27.3% below 50,000/mm³. Similarly high rates of thrombocytopenia have been documented by Brar et al. (2015), who reported platelet reduction in over half of their study population. Despite significant thrombocytopenia, only 21.2% of patients required blood transfusion, suggesting that close monitoring and conservative management were effective in most cases.

Regarding obstetric outcomes, 54.83% of women delivered vaginally, while 45.16% underwent cesarean section. This cesarean section rate is comparable to that reported by Sharma et al. (2019) and Thiyagalingam et al. (2013), where foetal distress and obstetric indications were the most common reasons for operative delivery. Importantly, 93.54% of women delivered at term, and only 6.45% had preterm births, which is lower than preterm rates reported in some earlier studies from endemic regions.

Neonatal outcomes in our study were largely favourable. Low birth weight and NICU admission were observed in 9.67% of neonates, similar to findings reported by Sirivavin et al. (2004) and Thaker et al. (2017), who concluded that uncomplicated dengue infection does not significantly impair foetal growth. Notably, no stillbirths or neonatal deaths were recorded in the present study, in contrast to earlier reports from severe dengue outbreaks where higher perinatal mortality was observed.

Only one patient in our study required ICU care, and no maternal mortality or major haemorrhagic complications were observed. This favourable outcome may be attributed to early diagnosis, vigilant haematological monitoring, judicious fluid management, and timely obstetric intervention. Similar conclusions have been drawn by Agrawal et al. (2014), emphasizing the role of supportive care in reducing maternal morbidity.

Overall, the maternal and foetal outcomes in the present series were favourable and support emerging evidence that with timely diagnosis and appropriate supportive management, dengue infection during pregnancy can often follow a benign clinical course.

CONCLUSION

Dengue infection during pregnancy continues to be an important clinical concern in tropical regions such as South India. In this prospective cross-sectional study involving 33 antenatal patients, the incidence of dengue positivity was 73.3%. The mean maternal age, parity, gestational age at delivery, and birth weight were comparable with most studies, with no statistically significant differences in obstetric or perinatal outcomes. Most infections occurred in the third trimester and were managed successfully with supportive therapy. None of the dengue-positive mothers developed severe complications, and maternal as well as neonatal survival was 100%.

The findings of this study highlight that, although dengue in pregnancy may cause transient thrombocytopenia and preterm labour, favourable outcomes can be achieved with early diagnosis, close maternal and foetal surveillance, and judicious fluid management. The results are consistent with contemporary literature suggesting that dengue infection, when detected and treated promptly, does not invariably worsen pregnancy outcomes.

Key Recommendations

1.Early Antenatal Screening:
All febrile antenatal patients should be screened for dengue NS1 antigen and IgM antibodies, especially during the monsoon and post-monsoon seasons when vector activity peaks.

2. Multidisciplinary Management:
Collaboration between obstetricians, physicians, and intensivists is essential for optimizing maternal and fetal outcomes in dengue-positive pregnancies.

3. Judicious Fluid and Platelet Therapy:
Fluid replacement should be carefully guided by hemodynamic status and haematocrit levels to prevent fluid overload. Platelet transfusion should be reserved for severe thrombocytopenia or clinical bleeding.

4. Foetal Surveillance:
Serial ultrasonography and foetal monitoring are recommended in the third trimester to detect preterm labour or foetal compromise early.

5. Hospital Preparedness:
Strengthening laboratory diagnostic capacity, antenatal triage, and dengue awareness programs within tertiary centres like Shivapriya Hospitals will improve early detection and evidence-based management of maternal dengue cases.

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