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Original Research Article

Retrospective study of maternal and fetal neonatal outcome of dengue virus infection during pregnancy at a tertiary care hospital

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ABSTRACT

Background: Dengue fever, a viral infection prevalent in tropical and subtropical areas, exhibits a varied clinical course. While a significant portion of infected individuals remain asymptomatic, the illness can range from a minimal febrile illness to life-threatening dengue shock syndrome. The most common presentation is a self-resolving febrile episode lasting 2-7 days, accompanied by severe headaches, myalgia, arthralgia, nausea, vomiting, and fatigue. However, a critical phase can follow the initial defervescence, characterized by severe abdominal pain, persistent vomiting, and hemorrhagic manifestations. Early recognition and management of severe dengue are essential for optimal outcomes. Females within their reproductive window residing in endemic regions of dengue are susceptible to infection. This study seeks to elucidate the association between dengue virus infection with pregnancy followed with subsequent neonatal outcome, maternal complications.
Methods: A retrospective observational study at was conducted at R. L. Jalappa Hospital and Research Centre, Kolar, India. The study examined the medical records of 28 pregnant women diagnosed with Dengue fever between January 2022 and January 2024.
Results: The study participants mean age was 25.6±5.2 years. Out of total, 50% cases were primi gravida and remaining 50% cases were multi gravida. Of total, 39% cases were required platelet transfusion. Among the study participants, total 11 (39.3%) cases ad presence of PPH, 10 (35.7%) cases delivered preterm babies and 1 maternal death was noted due to dengue fever. Of total, 17.9% fetal distress occurred, 42.9% baby required NICU admission after birth and 28.8% IUD were noted.
Conclusions: Severe dengue during pregnancy may raise the risk of obstetric haemorrhage, preeclampsia, and eclampsia, as well as increasing the chance of foetal distress, caesarean delivery, and mother death.

Keywords: Complications, Dengue fever, Maternal morbidity, Neonatal morbidity, Pregnancy

INTRODUCTION

Dengue fever, a viral infection prevalent in tropical and subtropical areas, exhibits a varied clinical course. While a significant portion of infected individuals remain asymptomatic, the illness can range from a self-limited febrile illness to life-threatening dengue shock syndrome. The most common presentation is a self-resolving febrile episode lasting 2-7 days, accompanied by severe headaches, myalgia, arthralgia, nausea, vomiting, and fatigue. However, a critical phase can follow the initial defervescence, characterized by severe abdominal pain, persistent vomiting, and hemorrhagic manifestations. Early recognition and management of severe dengue are essential for optimal outcomes. Females within their reproductive window residing in endemic regions of dengue are susceptible to infection.

Dengue virus infection constitutes a significant public health burden in tropical and subtropical regions.[1] Over half of the world's population is estimated to be at risk of Dengue infection, according to the World Health

Organization (WHO). This translates to roughly 2.5 billion people living in areas where the virus is a constant threat.[2]

Even in countries where the disease has been eradicated in the past, such as parts of Europe and the United States, there is still a chance that it might create widespread outbreaks.[3] Due to the virus's capacity to create catastrophic epidemics, public health experts are working harder than ever to contain the illness. Preterm births, low birth weight kids, and an increased frequency of caesarean deliveries are just a few of the pregnancy issues linked to dengue, according to a 2016 systematic analysis of the effects of the disease on mothers.

Nonetheless, our study did not find a definitive link between dengue infection in pregnant women and negative outcomes for their pregnancies.[4] There hasn't been any significant progress in the field's study since then, and a review of the literature revealed a paucity of carefully carried out prospective studies determining the trajectory of dengue-related pregnancies. This research investigated the impact of dengue infection during pregnancy on both maternal and their fetal outcomes.

This study seeks to elucidate the association between dengue virus infection with pregnancy followed with subsequent neonatal outcome, maternal complications.

METHODS

A retrospective observational study at was conducted at R. L. Jalappa Hospital and Research Centre, Kolar, India. The study examined the medical records of 28 pregnant women diagnosed with Dengue fever between January 2022 and January 2024.

Inclusion criteria

Patients over 18 years of age and pregnant women diagnosed with dengue NS1 Or IGM-positive status were included.

Clinical data were abstracted from medical records and subsequently entered into a predefined data collection form for the study. It includes the demographic and patient identification information such as name, age, and information about admission such as medical diagnosis, date of admission, and length of hospital stay. As well as details regarding the risk factors, clinical features, investigations, management, complications and fetal and maternal outcome were noted.

Data analysis

After collection, data was organized in an Excel sheet and analyzed with SPSS. Qualitative aspects were described with percentages and frequency while quantitative data used means and standard deviations.

RESULTS

The participants were 26-30 years old are of most common age group, accounting for 39.2% of the study population. The 21-25 age group followed closely behind. The average of the participants age in the study was 25.60 years old. There was also a standard deviation of 5.20 years (Table 1).

Table 1: Age wise group distribution.

Age group (in years)	Frequency	Percentages
18-20	5	17.8
21-25	9	32.2
26-30	11	39.2
31-35	1	3.6
>35	2	7.2

Out of total, 50% cases were primi gravida and remaining 50% cases were multi gravida (Figure 1). Of total, 39% cases were required platelet transfusion (Figure 2).

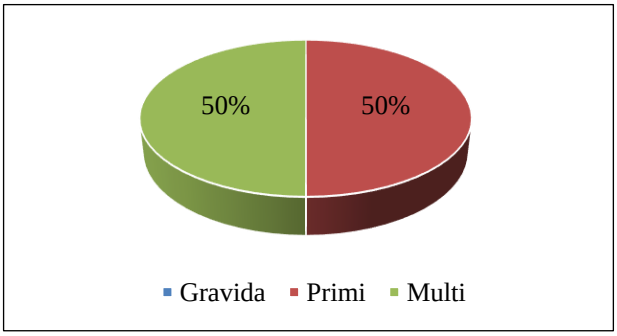

Figure 1: Gravida.

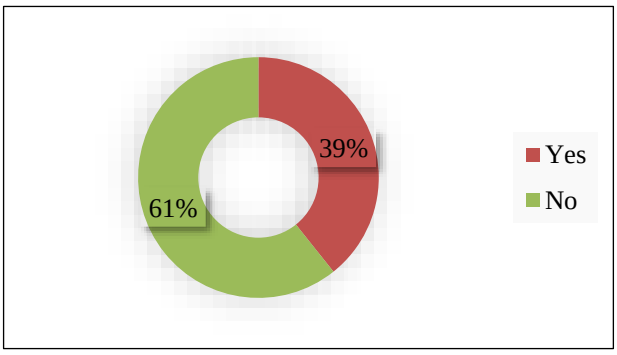

Figure 2: Requirement of platelet transfusion.

Table 2: History of comorbidities.

Comorbidities present	Frequency	Percentages
Hypertension	1	3.6
Diabetes	1	3.6

One patient had history of hypertension and another one patient ad history of diabetes mellitus (Table 2).

Of total, 68% patient had normal vaginal delivery (Figure 3).

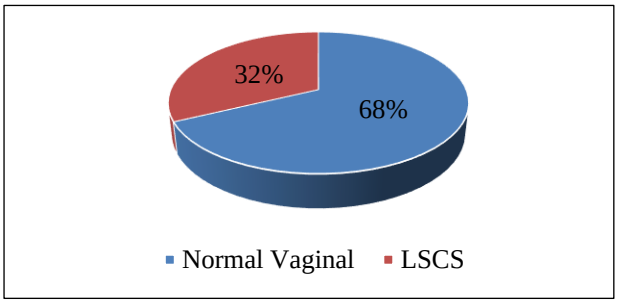

Figure 3: Mode of delivery.

Among the study participants, total 11 (39.3%) cases ad presence of PPH, 10 (35.7%) cases delivered preterm babies and 1 maternal death was noted due to dengue fever (Table 3).

Table 3: Maternal outcomes.

Maternal outcomes	Frequency	Percentages
Presence of PPH	11	39.3
Preterm delivery	10	35.7
Maternal death	1	3.6

Of total, 17.9% fetal distress occurred, 42.9% baby required NICU admission after birth and 28.8% IUD were noted (Table 4).

Table 4: Fetal outcomes.

Fetal outcomes	Frequency	Percentages
Presence of fetal distress	5	17.9
NICU admission	12	42.9
IUD	8	28.8

Out of total, almost 50% babies ad birth weight less than 2.5 kg (Figure 4).

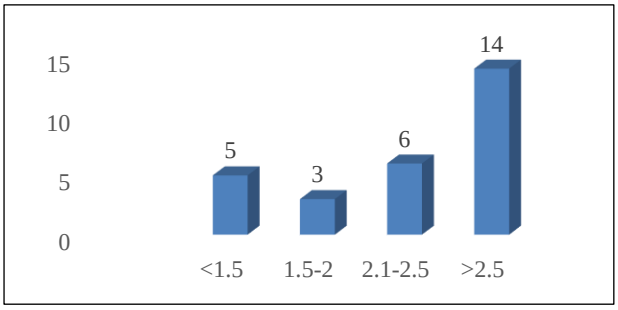

Figure 4: Birth weight.

DISCUSSION

To comprehensively elucidate, effects of dengue fever on maternal health, pregnancy outcomes, fetal development, further investigation is warranted. Dengue diagnosis in most participants occurred during the third trimester. These findings are consistent with those reported in earlier investigations.[5,6] This is probably because most hospitals treat women with dengue and early gestations by internists, while obstetricians treat women with later gestations because of obstetrical considerations like labour.

Incorrect serologic positive for NS1antigen or IgM antibody can lead to incorrect diagnoses of dengue in circumstances where clinical symptoms are lacking.[7] To minimize the influence of false-positive serology results on our findings, we included only participants who experienced fever in this study. The symptoms that we saw in this study matched those shown in previous investigations on both pregnant, non-pregnant women with the illness, with more than 90% of the women experiencing myalgia and arthralgia.[8–10]

The participants were 26-30 years old are of most common age group, accounting for 39.2% of the study population followed by 21-25 years of age group. The mean age of study participants was 25.6±5.2 years. Research done by Brar et al, the mean age of women was 24.5±0.71 (range 18–37) years.[9]

In this study, 50% cases were primi gravida and remaining 50% cases were multi gravida. Of total, 39% cases were required platelet transfusion. One patient had history of hypertension and another one patient ad history of diabetes mellitus. Of total, 68% patient had normal vaginal delivery. Among the study participants, total 11 (39.3%) cases ad presence of PPH, 10 (35.7%) cases delivered preterm babies and 1 maternal death was noted due to dengue fever. Of total, 17.9% fetal distress occurred, 42.9% baby required NICU admission after birth and 28.8% IUD were noted. Out of total, almost 50% babies ad birth weight less than 2.5 kg.

Our study found a concerningly high rate of severe complications after delivery, including hemorrhage, sepsis, shock, AKI, ARDS, and liver failure. Postpartum hemorrhage, likely due to dengue-related low platelet count, is a major concern supported by previous research showing rates between 2.2% and 30%.[10,11]

A prior study by Xiong et al, didn't find a strong link between dengue during pregnancy and stillbirth. While they reported a tripled risk (RR 3.42), the uncertain range (CI 0.76-15.49) suggests the evidence isn't conclusive. Furthermore, it did not evaluate the results of maternal or neonatal death. This study identified a concerning link between dengue infection during pregnancy and negative outcomes for both mothers and babies, such as stillbirth, maternal death, and newborn death. This study sheds light on a possible link between dengue virus (DENV) infection during pregnancy and negative outcomes for the developing baby, such as miscarriage, low birth weight, and preterm birth. However, further research is needed to

confirm a definitive cause-and-effect relationship. While they do not align with observations reported by Xiong et al, it is important to acknowledge the existence of some studies suggesting a potential association.[12]

Your research suggests a possible link between dengue infection in pregnancy and several complications. These include premature birth (around 14%), bleeding during pregnancy (nearly 14%), low birth weight (over 10%), miscarriage (around 6%), and stillbirth (slightly over 5%). However, it's important to remember that except for stillbirth, these findings weren't statistically significant when compared to pregnancies without dengue. The study also identified a high incidence of dengue shock syndrome (DSS) in pregnant women, reaching nearly 15%.[13]

CONCLUSION

In many cases, the consequences of dengue fever on mothers and newborns become critical, necessitating early management and control. For hopeful results, an appropriate treatment plan is necessary for fluid maintenance and prompt disease monitoring. However, the increased intravascular physiological volume during pregnancy leads to false positive dengue infection results. Our findings suggest a potential link between compromised placental function and adverse neonatal outcomes. The observed relationship between dengue infection and maternal and neonatal outcomes could be explained by damage to the lining of blood vessels (endothelial damage) and increased leakage of fluids from the blood vessels (vascular permeability). This leakage can disrupt the flow of essential nutrients and oxygen to the developing baby.

Severe dengue during pregnancy may raise the risk of obstetric haemorrhage, preeclampsia, and eclampsia, as well as increasing the chance of foetal distress, caesarean delivery, and mother death. Therefore, in order to avoid problems and guarantee the health of both the mother and the unborn, dengue management strategies should target pregnant women who have the dengue fever. The success of the NVBDCP hinges on the robust implementation of its delineated control strategies.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Guo C, Zhou Z, Wen Z, Liu Y, Zeng C, Xiao D, et al. Global epidemiology of dengue outbreaks in 1990-2015: a systematic review and meta-analysis. Front Cell Infect Microbiol. 2017;7:317.
2. World Health Organisation. Fact sheet: Neglected tropical diseases: Dengue. Available at: http://origin.searo.who.int/entity/vector_borne_tropical_diseases/data/data_factsheet/en/. Accessed 14 May 2024.
3. Lambrechts L, Scott TW, Gubler D. Consequences of the expanding global distribution of Aedes albopictus for the dengue virus transmission. PLoS Negl Trop Dis. 2010;4(5):e646.
4. Pouliot SH, Xiong X, Harville E, Paz-Soldan V, Tomashek KM, Breart G, et al. Maternal dengue and pregnancy outcomes: a systematic review. Obstet Gynecol Surv. 2010;65(2):107-18.
5. Chitra TV, Panicker S. Maternal and fetal outcome of dengue fever in pregnancy. J Vector Borne Dis. 2011;48(4):210-13.
6. Basurko C, Everhard S, Matheus S, Restrepo M, Hilderal H, Lambert V, et al. A Prospective matched study on symptomatic dengue in pregnancy. PLoS ONE. 2018;13(10):e0202005.
7. Matusali G, Colavita F, Carletti F, Lalle E, Bordi L, Vairo F, et al. Performance of rapid tests in the management of dengue fever imported cases in Lazio, Italy 2014–2019. Int J Infect Dis. 2020;99:193-8.
8. 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.
9. 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. Arch Gynecol Obstet. 2021;304(1):91-100.
10. 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(2):241-7.
11. Basurko C, Carles G, Youssef M, Guindi WEL. Maternal and fetal consequences of dengue fever during pregnancy. Eur J Obstet Gynecol Reprod Biol. 2009;147(1):29-32.
12. Xiong YQ, Mo Y, Shi TL, Zhu L, Chen Q. Dengue virus infection during pregnancy increased the risk of adverse fetal outcomes? An updated meta-analysis. J Clin Virol. 2017;94:42-9.
13. 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. Trop Med Int Health. 2022;27(7):619-29.

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