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Case Report

Dengue Virus Infection in Pregnancy: A Case Series

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Abstract

Background : Indonesia is an endemic country for dengue virus infections, particularly in several regions. Dengue virus infection is a disease caused by the dengue virus and transmitted through the bite of the Aedes aegypti mosquito. In pregnancy, dengue virus infection increases the risk of dengue shock syndrome, pre-eclampsia, fetal distress, preterm delivery, cesarean section and maternal death. Despite the abundance of reports on dengue infection in pregnancy, data from Indonesia remain limited, particularly regarding clinical presentation, management decisions, and outcomes in resource-limited settings. This case series aims to contribute practical insights into clinical management, decision-making during the critical phase, and maternal-fetal outcomes in dengue-infected pregnancies.

Cases : We report three cases of dengue virus infection during pregnancies. All three patients presented with acute fever and thrombocytopenia. Two of the three exhibited elevated in transaminase enzymes. One patient tested positive for NS1 antigen, while the other two tested positive for anti-dengue IgM and IgG. Blood component transfusions were administered to two patients during treatment. Two cases underwent termination of pregnancy via cesarean section due to indications of maternal and fetal distress. One neonate initially presented with an abnormal outcome but showed clinical improvement after intensive treatment. All three cases had normal maternal outcomes.

Discussion : Pregnancy involves various physiological changes related to the cardiovascular, respiratory, and hematological systems. In these three cases, acute fever and thrombocytopenia (first and second cases) were observed, and there was no increase in hematocrit exceeding 20% of the baseline data, thus leading to a diagnosis of dengue fever. The WHO states that there is no difference in the amount and rate of intravenous fluid administration for pregnant and non-pregnant women, but recommends using pre-pregnancy body weight for fluid calculations. During the critical phase, termination of pregnancy should be performed only if the mother's life is threatened or if the patient experiences spontaneous labor. Timely multidisciplinary decision-making is crucial to optimize maternal and fetal outcomes, as fetal complications such as distress or preterm delivery may occur. In the first case,

termination of pregnancy by cesarean section during the critical phase was performed due to induction failure and fetal distress. The neonate initially suffered moderate asphyxia but experienced clinical improvement after intensive care.

Conclusion : Dengue virus infection in pregnancy increases the risk of morbidity and mortality for both mother and fetus. Therefore, strict monitoring and evaluation are needed, as well as management involving a multidisciplinary team that considers aspects of maternal and fetal safety.

Keywords : dengue virus infection, pregnancy, maternal and fetal outcome

INTRODUCTION

Indonesia is an endemic country for dengue virus infections, particularly in several regions.[1,2] Dengue virus infection is a disease caused by the dengue virus which is transmitted through the bite of the *Aedes aegypti* mosquito.[3] In 2021, Indonesian Ministry of Health reported 73,518 cases of dengue virus infection with 705 fatalities.[1,4] This number increased sharply in 2022 to 143,266 cases and 1,237 deaths. In 2023, there were 114,720 infections and 894 deaths.[1,4]

Dengue virus infection during pregnancy presents significant health risks for both mothers and their infants, with a range of potential complications and adverse outcomes.[5–7] It increases the risk of dengue shock syndrome, pre-eclampsia, fetal distress, preterm delivery, cesarean delivery and maternal death.[5–8]

Although dengue virus infection in pregnancy has been reported globally, data from Indonesia are still scarce, especially regarding how clinical management is adapted in real- world hospital settings with limited access to molecular diagnostics such as RT-PCR.[7,15,31] This case series aims to describe three cases of dengue virus infection during pregnancy, focusing on clinical presentation, management decisions, and outcomes. By presenting these cases, this report contributes to a better understanding of how dengue infection affects pregnancy and highlights the importance of individualized management strategies in endemic, resource- limited contexts.[2,14,27]

CASE ILLUSTRATION

Case 1

A 26-year-old female, G2P0A1 at 38 weeks of pregnancy presented with complaints of fever for 5 days, retro-orbital pain, muscle pain, a sudden gush of watery fluid from vagina since 12 hours prior to hospital admission and infrequent contraction. On physical examination, the patient was hemodynamically stable with a temperature of 37.0°C. Laboratory examination revealed hemoglobin 16g/dL, hematocrit 45.5%, leukocytes 11,000/µL, thrombocytopenia 48,000/µL, AST 71 U/L, ALT 25 U/L, prolonged coagulation study (aPTT/Control 36.9 seconds/25.9 seconds), anti-dengue IgM (-), anti-dengue IgG (+). During treatment, the patients received crystalloids therapy according to guidelines. On the second day of treatment, the patient underwent termination of pregnancy by cesarean section due to indications of failed induction and fetal distress. A baby girl was born weighing 3495 grams, with an APGAR score 5-6-7, necessitating treatment in the Neonatal Intensive Care Unit (NICU), where CPAP therapy was administered for 3 days due to respiratory distress. The total NICU length of stay was 8 days.

After delivery, vaginal bleeding of 800 mL occurred. Transfusion of one unit of whole blood and one unit fresh frozen plasma was administered. During treatment, the patient received management for Premature Rupture of Membranes (PROM) according to the Obstetrics and Gynecology Clinical Practice Guidelines which included prophylactic antibiotics (ampicillin 2 grams intravenous, followed by erythromycin 500 mg/6 hours orally for 5 days). Diuresis remained >0.5 mL/kg/hour. On the fifth day of treatment, the patient was clinically and hemodynamically stable, afebrile for >24 hours without antipyretics, platelets increased to 136,000/µL, and transaminase enzymes returned to normal, the patient was allowedto be outpatient. The mother was discharged in stable condition and advised to return for postpartum evaluation within one week.

During the NICU stay, the infant showed gradual improvement, with no signs of long- term complications such as seizures, feeding intolerance, or abnormal neurological reflexes. Breastfeeding was successfully initiated after respiratory support was discontinued, and maternal-infant bonding was supported in the latter part of the NICU stay. Upon outpatient follow-up, the mother remained clinically stable with no signs of infection or bleeding, and the infant showed appropriate weight gain, adequate feeding, and no further respiratory symptoms.

Case 2

A 26-year-old female, G2P1A0 at 35 weeks of pregnancy, presented with fever for 5 days and muscle pain. The patient's neighbor had dengue infection. On physical examination, hemodynamics were stable. Laboratory

examination revealed hemoglobin 12.6 g/dL, hematocrit 39.3%, leukocytes 6,700/µL, thrombocytopenia 31,000/µL, AST 62 U/L, ALT 34 U/L, and coagulation profile within normal limits, with positive anti-dengue IgM, anti-dengue IgG. During treatment, patients received crystalloids and antipyretic therapy according to guidelines. Serial routine blood monitoring and blood clotting time every 8–12 hours, revealed a reduction in platelets to 20,000 without bleeding. The patient received 4 unit thrombocyte concentrate transfusions. During treatment, diuresis remained >0.5 mL/kg/hour. On the fifth day of treatment, patient was clinically and hemodynamically stable, afebrile for >24 hours without antipyretics, platelets increased to 96,000/µL, transaminase enzymes improved, the patient was then discharged for outpatient. Following hospital discharge, the patient has continued routine antenatal care and reports no new symptoms.

Case 3

A 29-year-old female, G3P2A0 at 37 weeks of pregnancy, was admitted to the hospital with fever for 3 days, muscle pain and nausea. The patient's husband previously had a dengue infection. On physical examination, the temperature was 38.9°C. Laboratory examination revealed moderate microcytic hypochromic anemia (hemoglobin 8.8 g/dL), hematocrit 28.3%, leukocytes 5,000/µL, platelets 215,000/µL, AST 28 U/L, ALT 37 U/L, and a positive NS1 antigen. The patient received

TABLE 1
Summary of clinical and laboratory characteristics of serial case study

Clinical and laboratory characteristics	Case 1	Case 2	Case 3
Age (years)	26	26	29
Gestasional age (weeks)	38	35	37
Presenting complaints	Fever for 5 days, retro-orbital pain, muscle pain, sudden gush of watery fluid from vagina and infrequent contraction. Vaginal bleeding of 800 mL after delivery	Fever for 5 days and muscle painafter delivery	Fever for 3 days, muscle pain and nausea
Delivery method	CS	–	CS
Transfusion of blood components	WB, FFP	TC	PRC
Hemoglobin (g/dL) (Highest)	16.0	13.8	9.7
Hemoglobin (g/dL) (Lowest)	9.6	11.9	7.9
Hematocrit (%) (Highest)	46.2	42.5	29.9
Platelet (10^3/µL) (Lowest)	32	20	133
AST/ALT (U/L) (Highest)	102/71	62/34	28/37
NS1 Antigen	N/A	N/A	NS1 (+)
Anti–Dengue IgM/IgG	IgM (–)	IgM (+)	N/A
	IgG (+)	IgG (+)	
RT–PCR/DENV maternal	N/A	N/A	N/A
RT–PCR umbilical cord	N/A	N/A	N/A
Maternal outcome	Normal	Normal	Normal
Neonatal clinical characteristics	3.495g	–	2.710g
	Apgar Score: 5/6/7		Apgar Score: 9/9/10
	Moderate asphyxia		Normal vitality

N/A : not available; CS : cesarean section; PRC : packed red cell; WB : whole blood; TC : thrombocyte concentrate; FFP: fresh frozen plasma

crystalloids and antipyretics therapy according to the guidelines. On the third day of treatment, the patient underwent cesarean section due to indication of placenta previa totalis and a history of previous cesarean section. Baby boy was born weighing 2710 grams, clinically fit. During treatment, diuresis remained >0.5 mL/kg/hour. On the fifth day of treatment, the patient was clinically and hemodynamically stable, afebrile for >24 hours without antipyretics, and platelets were 133,000/µL. Both the patient and the baby were then discharged from hospital. The mother was advised to undergo a postpartum follow-up visit within 7 to 10 days after discharge to evaluate clinical recovery, monitor wound healing from cesarean section, and assess for any signs of secondary infection or delayed complications associated with dengue infection. The newborn, who was clinically fit at birth, was scheduled for routine neonatal follow-up within one week of discharge to monitor weight gain, feeding adequacy, and overall development. The mother reported no complications during thepostpartum period following hospital discharge. At the post-discharge visit, the baby had gained appropriate weight and showed normal developmental progress.

DISCUSSION

Dengue virus infection is characterized by fever for 2–7 days, retro-orbital pain, arthralgia, myalgia, bleeding manifestations, leukopenia, and thrombocytopenia.[2,3] Dengue fever is differentiated from dengue hemorrhagic fever based on the absence of plasma leakage.[3] In pregnancy, various physiological changes related to the cardiovascular, respiratory and hematological systems.[6,32] At the end of the third trimester, plasma volume increases by approximately 40%, resulting in dilutional anemia, thereby obscuring the hemoconcentration that occurs in the critical phase.[6] It is important to monitor diuresis in addition to hemodynamics to ensure adequate fluid requirements, especially during the critical phase.[3]

The World Health Organization (WHO) states that there is no difference in the amount and rate of intravenous fluid administration for pregnant women and non-pregnant women. Forfluid calculations, the pre-pregnancy body weight should be used.[3] In the three cases presented, patients experienced acute fever, thrombocytopenia (first and second cases) and there was no increase in hematocrit of more than 20% of the baseline data, thus leading to the diagnosis of dengue fever.

In the clinical evaluation of febrile illness during pregnancy, especially in dengue- endemic regions, it is important to consider several differential diagnoses that may present with similar clinical and laboratory features. These include malaria, typhoid fever, leptospirosis, chikungunya, COVID-19, urinary tract infection, and HELLP syndrome. All of these conditions can manifest with fever, thrombocytopenia, and elevated liver enzymes, overlapping with dengue presentations.[16–18] However, in all three cases presented, the diagnosis of dengue was supported by compatible clinical features, epidemiological exposure, and positive dengue- specific serological markers (NS1 antigen or anti-dengue IgM/IgG).[15,31] The absence of other signs such as hemolysis, bacterial infection markers, or specific exposure history helped to rule out these alternative diagnoses and supported the working diagnosis of dengue infection.[16,17]

Both the first and second cases indicated secondary dengue infection, while the third case was diagnosed with dengue based on a positive NS1 antigen result.[15,31] Diuresis was monitored every 4 hours and adequate diuresis (>0.5 mL/kg/hour) in all three patients during treatment.

During the critical phase, vaginal delivery or cesarean section should be performed only if the mother's life is threatened or the patient experiences spontaneous labor.[8] The American College of Obstetrics and Gynecology (ACOG) recommends platelet transfusion with a target platelet count of more than 50,000/µL before major surgery.[9] The Italian Society of Transfusion Medicine and Immunohaematology (SIMTI) recommends that prophylactic platelet transfusions be administered if platelets are less than 20,000/µL in a febrile patients without bleeding,[10] whereas the British Committee for Standards in haematology recommends platelet transfusions if platelets are less than 10,000/µL without bleeding.[11] Additional guidelines emphasize clinical judgment and institutional protocols.[12,13]

In all three cases, the timing and indication for cesarean section were clearly presented; however, a more detailed discussion of the risk-benefit considerations and adherence to clinical guidelines is essential, particularly regarding performing delivery during the febrile or critical phase of dengue infection.[8,20,33]

In the first case, termination of pregnancy by cesarean section was performed on the second day of hospitalization during the critical phase, with thrombocytopenia (48,000/µL), prolonged aPTT, and a background of secondary dengue infection (IgG positive).[5,9] The procedure was indicated due to failed induction and signs of fetal distress, both of which constituted obstetric emergencies.[8,21] Although the timing was not ideal in terms of dengue phase, the decision was made to prioritize fetal survival and avoid further deterioration.[8] The risk of hemorrhagic complications was mitigated by preoperative evaluation, availability of blood products, and close monitoring.[9,12,13] Postoperatively, the maternal condition remained stable, platelets increased to 136,000/µL, and she was discharged on day five.[8,22] The neonate, who suffered moderate asphyxia, required intensive care but showed clinical improvement with NICU support.[25] Alternative

management approaches such as delaying delivery until the recovery phase were considered; however, they were not feasible due to the obstetricemergency. This deviation from standard dengue management was justified by the need to address failed induction and fetal distress, which posed immediate risks to both mother and fetus.[8,21]

In the second case, although the patient had severe thrombocytopenia with a nadir of 20,000/μL during the critical phase,[9,10] there was no obstetric indication for delivery. Accordingly, the medical team followed a conservative approach, adhering to clinical guidelines that recommend delaying elective delivery during the febrile or critical phase of dengue unless maternal or fetal complications arise.[8,20,33] The patient received four units of platelet concentrate,[9,12] and her condition improved without requiring delivery. On day five, with platelets rising to 94,000/μL and clinical stabilization, the patient was discharged and continued routine antenatal care without further complications.[8,22] This case illustrates appropriate risk-benefit consideration and compliance with dengue management protocols in pregnancy.[8,20]

In the third case, cesarean section was performed during the febrile phase due to a clear obstetric indication––placenta previa totalis combined with a history of previous cesarean section––which carries a high risk of massive hemorrhage and maternal morbidity if not addressed promptly.[8,23] Although the patient was still febrile (38.9°C) on admission, her platelet count was within normal limits (215,000/μL), and liver enzymes were only mildly elevated.[3] Given the high obstetric risk and acceptable hematological parameters, the benefit of timely delivery outweighed the risks associated with dengue.[8,20] Both maternal and neonatal outcomes were favorable, and the patient was discharged on the fifth day.[22,25]

These cases emphasize the importance of individualized decision-making in managing dengue-infected pregnancies.[8,33] While elective delivery is generally deferred during the critical phase of dengue due to increased bleeding risk,[3] emergency obstetric indications may necessitate surgical intervention regardless of the dengue phase.[8,23] In such situations, careful perioperative planning, availability of blood products, and multidisciplinary collaboration are critical for optimizing outcomes.[8,33] Highlighting these justifications supports clinical relevance and reflects real-world complexity in managing dengue during pregnancy.[20,33]

Recent literature has reported that dengue infection during pregnancy may be associated with a higher incidence of preterm delivery, intrauterine growth restriction, and stillbirth compared to non-infected pregnancies.[5,19,29,30] The findings in this case series align with prior studies showing that most maternal outcomes are favorable with timely fluid management and close monitoring, but fetal complications such as distress and asphyxia remain possible during the critical phase.[5,19,25]

The management observed in these cases supports the growing consensus that multidisciplinary collaboration is essential to optimize outcomes.[24,33] The cases also underscore the importance of conservative management whenever possible and the need for precise decision-making regarding delivery timing, especially in the presence of fetal distress or obstetric emergencies.[8,33]

Clinically, this case series illustrates that while serological confirmation (NS1, IgM, IgG) remains the most practical diagnostic approach in endemic settings, access to RT-PCR could improve diagnostic accuracy and epidemiological understanding.[15,21,31] Future case management and reporting should integrate molecular

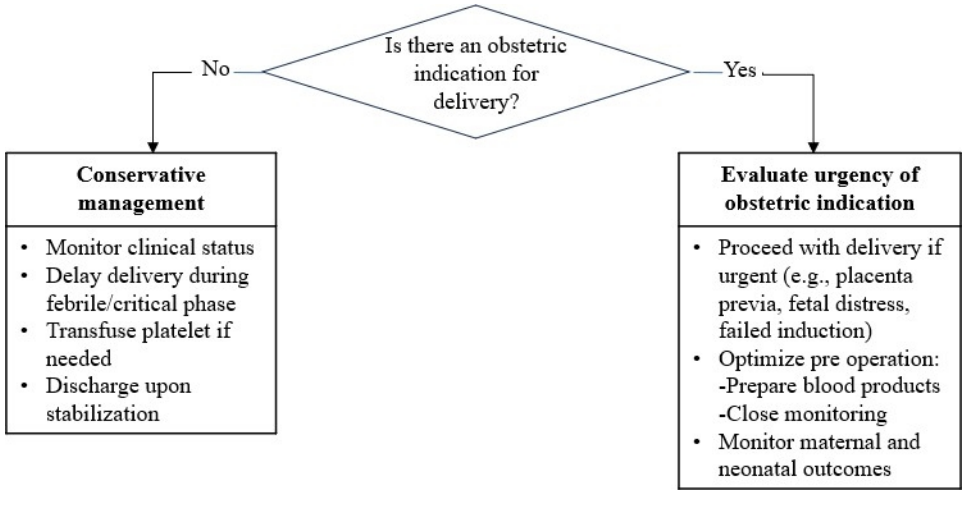

Figure 1. Decision Flowchart: Delivery Management in Pregnant Patient with Dengue Virus Infecion[3,8,9,33]

confirmation and dengue serotype identification, as these factors may correlate with the severity of maternal and neonatal outcomes.[21,26]

From a public health perspective, these findings reinforce the need for enhanced surveillance of dengue in pregnancy and the inclusion of pregnancy-specific management protocols in national dengue control programs.[1,4,27,28]

A limitation of this case series is that the marker for plasma leakage was based solely on the hematocrit value, without the use Chest X-ray or abdominal ultrasound to rule out pleural effusion or ascites.[3] In all three reported cases, the diagnosis of dengue infection was based on clinical features, epidemiological exposure, and serological testing, including NS1 antigen and/or anti-dengue IgM/IgG assays. These tests are relatively inexpensive than reverse transcriptase polymerase chain reaction (RT-PCR) and can be performed at the point of care, making them suitable for resource-limited settings. However, RT-PCR, the current gold standard for confirming dengue virus infection and determining the viral serotype, was not performed. PCR testing requires specialized laboratory equipment and trained personnel, which may not be readily available in all hospitals, particularly in particularly in low- and middle- income countries (LMICs).[15,31]

In real-world clinical practice, particularly during outbreaks or in endemic areas, serological testing combined with clinical and epidemiological findings is often sufficient to initiate appropriate management.[3,15,31] In these cases, all patients presented during pregnancy with typical symptoms of dengue, supported by positive NS1 antigen or anti-dengue IgM/IgG results,[15,31] and responded to dengue-targeted supportive therapy as outlined in current clinical guidelines.[3,8,14]

While the use of RT-PCR could have strengthened diagnostic confirmation and enabled serotype identification––potentially providing more insight into the risk of severe dengue or secondary infection––its omission did not alter the overall management or clinical outcomes inthese cases.[15,21,31] Nevertheless, the authors acknowledge that future cases would benefit from RT-PCR testing where available, particularly for research, surveillance, and epidemiological tracking of dengue virus serotypes in pregnant populations.

CONCLUSION

Dengue virus infection in pregnancy increases the risk of morbidity and mortality for both mother and fetus. Therefore strict monitoring and evaluation are needed as well as management involving a multidisciplinary team that considers aspects of maternal and fetal safety.

INFORMED CONSENT

Written informed consent was obtained from the patients for the publication of this case series and any accompanying data. All identifying details have been omitted to protect patient confidentiality, and the report complies with ethical publication standards.

CONFLICT OF INTEREST

The authors declare no conflict of interest

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