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Case Report

Paediatrics Section

Postnatally Acquired Dengue Fever Presenting as Persistent Fever and Thrombocytopenia in a Neonate: A Rare Case Report

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ABSTRACT

Dengue fever is a major public health concern in tropical and subtropical regions, including India. While it is common in older children and adults, its occurrence in neonates is rare, possibly due to the protective effect of maternal antibodies, which typically wane over the first 6-12 months of life. Neonatal dengue can occur through vertical transmission from a symptomatic mother, where the presentation is at birth. However, very rarely, postnatal acquisition can occur in an otherwise healthy baby via the bite of an infected Aedes mosquito. Here, we present a unique case of postnatally acquired dengue fever in a term baby, wherein the initial symptoms were attributed to sepsis. However, the lack of response to antimicrobials and sterile cultures raised suspicion of an alternative diagnosis for which further investigations were planned. Owing to the endemic nature of the disease, dengue serology was included in the panel, which turned out to be positive. This case is unique in terms of presentation in the late neonatal period, despite a positive dengue serology in an otherwise asymptomatic mother, the presence of hepatosplenomegaly in the baby, severity of the illness, and a lack of typical clinical features such as rash. This report highlights the diagnostic challenges, management strategies, and outcomes, drawing parallels with existing literature to emphasise the importance of considering dengue in the differential diagnosis of neonatal sepsis in endemic settings, particularly where outbreaks are frequent during the monsoon and post-monsoon seasons.

Keywords: Endemic area, Maternal antibodies, Platelet count, Sepsis, Vertical transmission

CASE REPORT

A term, 37-week-old male newborn, born to a 28-year-old mother from a non-consanguineous marriage, through normal vaginal delivery, presented to the paediatric emergency department on Day 17 of life. The mother had no history of chronic illnesses, and her antenatal period was uneventful, with no reported fever or symptoms suggestive of dengue during pregnancy. The newborn weighed 2.8 kg at birth and had an APGAR score of 8 and 9 at one and five minutes, respectively, with no congenital anomalies. He was shifted to his mother's side post-delivery and initiated on exclusive breastfeeding, enjoying an unremarkable postnatal course until Day 7 of life.

On Day 7, the mother reported that the neonate had developed a high-grade fever (temperature 39.2°C), irritability, and reduced oral acceptance of breast milk. The family sought care from a local practitioner, where the neonate was diagnosed with presumed neonatal sepsis based on clinical presentation. Initial blood investigations revealed leukopenia (total leukocyte count of 3,800/mm^3), thrombocytopenia (platelet count of 22,000/mm^3), and a mildly elevated C-Reactive Protein (CRP) level of 12 mg/L [Table/Fig-1]. Blood and urine cultures were collected to look for evidence of bacterial or fungal growth prior to the initiation of empirical intravenous antibiotics (ampicillin 100 mg/kg/day and gentamicin 5 mg/kg/day), along with supportive care, including intravenous fluids. Despite 10 days of antibiotic therapy, the fever persisted (ranging between 38.5°C and 39.5°C), and the platelet count remained low (18,000-25,000/mm^3). Although no overt bleeding manifestations (e.g., petechiae, epistaxis, or gastrointestinal bleeding) were observed, the neonate developed signs of circulatory compromise, including tachycardia (heart rate 160 beats/min), prolonged capillary refill time (>3 seconds), and hypotension (blood pressure 50/30

Day of life →	Day 7	Day 17	Day 19	Day 20	Day 34	Day 40
Haemoglobin (g/dL)	-	12.5	13	13.5	13.8	14
Haematocrit	-	38%	40%	48%	50%	49%
Total leucocyte count (cells/mm^3)	3800	4500	4200	4300	4000	4000
Platelet count (per mm^3)	22,000	20,000	18,000	30,000	50,000	1 lac
CRP (mg/L)	12					
Blood culture	Sterile					
AST (IU/L)		120		150		40
ALT (IU/L)		90		110		35
Serum albumin (g/dL)		2.8				
Prothrombin Time (PT)		16 seconds				
INR		1.4				
CSF						
Cell count	50/mm^3 (80% lymphocytes)					
Glucose	45 mg/dL					
Protein	80 md/dL					
Microscopy & culture	Negative					

[Table/Fig-1]: Investigations.
CRP: C-reactive protein; AST: Aspartate aminotransferase; ALT: Alanine aminotransferase; INR: International normalised ratio; CSF: Cerebrospinal fluid

mmHg), suggestive of shock. Blood cultures returned sterile, prompting referral to a tertiary care centre on Day 17 of life for further management.

Upon admission to the Neonatal Intensive Care Unit (NICU), the neonate was lethargic, febrile (temperature: 39°C), tachycardic (heart rate 194 beats/min), and hypotensive (blood pressure 54/32 mmHg), with a respiratory rate of 60 breaths/min and oxygen saturation of 92% on room air. Physical examination revealed mild hepatosplenomegaly (liver 3 cm below the costal margin, spleen 2 cm below the costal margin), but no rash, jaundice, or bleeding sites.

Laboratory investigations revealed a haemoglobin level of 12.5 g/dL, haematocrit of 38%, White Blood Cell (WBC) count of 4,500/mm^3 (with lymphocytic predominance of 60%), platelet count of 20,000/mm^3, Aspartate Aminotransferase (AST) 120 IU/L, Alanine Aminotransferase (ALT) 90 IU/L, and serum albumin of 2.8 g/dL. Coagulation parameters were mildly deranged {prothrombin time- 16 seconds, International Normalised Ratio (INR) - 1.4}. A lumbar puncture was performed to rule out meningitis, revealing Cerebrospinal Fluid (CSF) pleocytosis with a lymphocytic picture (cell count 50/mm^3, 80% lymphocytes, glucose 45 mg/dL, protein 80 mg/dL). No organisms were seen on gram staining, and CSF culture was negative.

Given the clinical profile of fever with hypotension, complemented by biochemical evidence of thrombocytopenia and sterile blood cultures, suspicion of an alternative diagnosis was raised, leading to the ordering of a dengue diagnostic panel among other investigations on day 18 of life. The dengue Non-Structural protein-1 (NS-1) antigen test was negative, but dengue Immunoglobulin M (IgM) antibodies, identified by immunochromatography (rapid card test), were positive, confirming acute infection. Dengue Immunoglobulin G (IgG) was weakly positive, suggesting possible waning maternal antibodies or early seroconversion. Reverse Transcription-Polymerase Chain Reaction (RT-PCR) for dengue virus RNA could not be performed due to resource constraints. All other investigations were normal. Maternal serology, tested retrospectively, was positive for dengue IgM and IgG, although she denied symptomatic illness during pregnancy or the immediate postpartum period. This raises the possibility of asymptomatic maternal infection and postnatal transmission to the baby via mosquito bite. The presence of dengue IgM antibodies in the mother, indicating recent infection, raises suspicion of vertical transmission, a commonly known route of acquiring neonatal dengue. However, the presentation beyond one week of life leans toward the possibility of postnatally acquired infection from the bite of an infected mosquito.

The baby was managed as a case of Dengue Shock Syndrome (DSS). Intravenous antibiotics (cefotaxime and amikacin at dosages of 150 mg/kg/day and 15 mg/kg/day, respectively) were initiated alongside intravenous fluids (crystalloids titrated to 20 mL/kg boluses, followed by maintenance fluids) and inotropic support (dopamine 10 µg/kg/min and dobutamine 8 µg/kg/min) to address haemodynamic instability. Platelet transfusions were avoided due to the absence of bleeding and evidence suggesting limited efficacy in dengue-related thrombocytopenia [1]. Serial monitoring showed persistent thrombocytopenia (nadir of 18,000/mm^3 on day 19 of life) and elevated liver enzymes, peaking at AST 150 IU/L and ALT 110 IU/L on day 20 of life.

By day 17 of the hospital stay (day 34 of life), the infant's fever subsided, the platelet count improved to 50,000/mm^3, and vital signs stabilised {Heart Rate (HR) 130 beats/min, Blood Pressure (BP) 70/45 mmHg}. Inotropes were tapered and discontinued by day 18 of admission. Feeding was reintroduced on day 19 of admission via a nasogastric tube with expressed breast milk (10 mL every 2 hours), progressing to katori-spoon feeds by day 21 and direct breastfeeding by day 23. Laboratory parameters started improving from day 23, with the platelet count at 100,000/mm^3 showing a rising trend, and AST at 40 IU/L and ALT at 35 IU/L. The baby was discharged on the 25th day of admission on exclusive breastfeeding, weighing 2.9 kg, with stable vital signs and normal laboratory parameters.

The child was initially evaluated one week post-discharge, followed by monthly visits. The child is growing normally; the liver and spleen had regressed to normal size by one week, and platelet counts and liver function tests were within normal limits. Currently, the child is healthy with no sequelae and is on exclusive breastfeeding with regular follow-up.

DISCUSSION

Dengue is a common viral infection endemic to the South Asian region, including India, and poses a major public health problem. It was traditionally thought to occur beyond one year of life; however, recent reports have shown an increasing incidence in neonates as well [2]. Vertical transmission is known to occur, resulting in increased perinatal morbidity and mortality, which has been correlated with the severity of maternal illness [2,3]. Studies have shown an increased risk of maternal and neonatal mortality due to dengue infection during the antenatal period [4,5]. The majority of cases reported in the literature suggest transmission of the infection from mother to foetus, with clinical presentations seen from day one of life [6]. However, a few cases of postnatally acquired dengue infection in neonates have been identified, as was the case described here [7].

Clinical presentations in neonates and infants differ from those in older children in terms of atypical presentations and a higher risk of complications such as hepatic dysfunction (as seen in the case described above) and a higher case fatality rate. This is possibly due to delays in diagnosis and, consequently, delays in the institution of appropriate management [8]. Moreover, the clinical presentation overlaps with other well-known disorders, the most common being neonatal sepsis, which may progress into septic shock. Thrombocytopenia may be an indicator of fungal sepsis or a bleeding disorder. Other infections, both common (such as TORCH infections) and rare (like neonatal malaria), may mimic the clinical features of dengue, including fever, hepatosplenomegaly, rash, thrombocytopenia, and sometimes shock. This situation mandates a high index of suspicion for neonatal dengue, with or without evidence of maternal disease, especially during the dengue season in endemic countries, which are usually low-resource countries that further create diagnostic challenges.

In a limited-resource healthcare system, rising haematocrit due to plasma leakage caused by cytokine release in Dengue Haemorrhagic Fever (DHF), along with leukopenia and thrombocytopenia due to virus-induced bone marrow suppression, are of great value in diagnosing DHF. Features of DSS include circulatory shock, hepatomegaly, and hypoalbuminaemia [9]. Limitations of this report include the lack of RT-PCR to confirm viraemia and serotyping, which could elucidate virulence factors [10]. The development of a dengue vaccine has been considered against all genotypes of the four serotypes, as discussed in a recently published review [11].

CONCLUSION(S)

This case report discusses a rare presentation of DSS in a term neonate, with no clinical evidence of the disease in the mother other than positive serology. Neonatal dengue often masquerades

as sepsis, resulting in delays in diagnosis and unnecessary use of antimicrobials. Moreover, excessive intravenous fluids and blood transfusions may further complicate DSS, as the pathophysiology is completely different from that of septic shock. A high index of suspicion in endemic areas, especially during outbreaks, is of utmost importance in facilitating an early diagnosis.

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