



## Case Study

### Unusual presentation of vertical dengue infection: A case report and review of literature

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#### ABSTRACT

A case study report of vertical transmission of dengue infection in a new born from India. The mother, G2P2A1 at 35 weeks of gestation underwent cesarean section in view of oligohydramnios. A patient developed fever with shivering postoperatively which did not subside with routine antibiotics. Patient did not experience any hemorrhages including from the surgical wound. Patient platelet count fell at its lowest to 23,000/mm<sup>3</sup>. Dengue NS1 antigen test was done and she was detected positive for dengue. Patient received symptomatic treatment. On Day 5 after birth, baby developed lethargy and grunting. The baby was tested for NS1 dengue antigen and detected positive. The platelets count fell to its lowest of 14,000/mm<sup>3</sup> on day-3 of his illness. The baby was treated with platelet transfusion and was discharged on day 13 after birth. This report emphasizes that in a dengue epidemic or when dengue is endemic, a pregnant woman with fever raises a high suspicion that the baby may develop the disease, and both the mother and baby should be closely followed-up.

#### Keywords

Vertical transmission,  
Dengue,  
NS1 antigen

## Introduction

Dengue viruses are the most common arboviral cause of illness and death in the tropics and subtropics (Guzman MG., 2010). Over the past 50 years, geographic expansion of areas where transmission occurs and increased transmission intensity has led to a 30 fold increase in the reported incidence of dengue globally. The four related, but antigenically distinct dengue serotypes belong to the Flaviviridae family. Now, nearly two fifths of the world's population is at risk of infection from one of the four dengue serotypes (San Martin JL., 2010). Furthermore, the increased incidence has been accompanied by an increase in

clinically severe disease (Gubler DJ., 2006). Dengue infections are often asymptomatic, but many result in dengue fever, a flu-like illness with fever, headache, joint and muscle pain, and rash, and some result in severe disease which may include extensive bleeding, plasma leakage, and death (Kyle JL, Harris, 2008). The more severe manifestations of dengue are associated with secondary dengue infections of heterologous serotypes (Gibbons, 2010). Infection severity likely also depends on specific strains or genotypes within each serotype (Rico-Hesse, 2010).

The author presents a case report and a review of unusual presentations of vertical dengue infections. The objective of the case report is to raise awareness to the possibility of mother-child transmission of dengue, which affects the newborn presenting a clinical picture similar to neonatal sepsis leading to the possibility of not being diagnosed.

### **Case report**

A 34 year old antenatal mother, G2P2A1 with 35 weeks gestation was operated for Lower segment cesarean section(LSCS). She delivered a male baby weighing 2.38 kg with an APGAR score of 8/10 and 9/10 at 1 and 5 minutes respectively. On birth; baby's cry, Neonatal reflex, Moro reflex, sucking and swallowing reflex were positive. But Grunting was present, so baby kept in NICU for observation. After stabilising baby, the baby was shifted to mother side.

Postoperatively, the mother had temperature of 100° F with shivering and she was started on antibiotics. On Day 1 she had temperature of 102° F. A septic screen of urine, high vaginal swab and blood culture and sensitivity were negative. Platelet count decreased to 90,000. Hence, since mother was not responding to antibiotics and in view of low platelet count, dengue was suspected. Dengue NS1 antigen test done was positive. In her post-operative days, high fever continued, but no hemorrhage was observed from the surgical wound.

### **Initial Laboratory Report**

On D5 after birth the baby was admitted in NICU with complaints of lethargy and grunting. Blood group O positive (mother's blood group B positive). Investigations revealed dengue NS1 antigen positive. Baby was kept nil by mouth and started on IV

fluids. Within 2 days platelet count dropped to 14000/mm<sup>3</sup> for which the baby was given platelet transfusion. Platelet count increased to 95000/mm<sup>3</sup>. Baby condition improved; started taking feeds well and was discharged out on day 13 after birth.

### **Discussion**

The first reported neonate of vertical dengue infection was born in 1989 in Tahiti. To date, few cases of vertical dengue infection have been published in the literature. The source of infection could be mother or an infected mosquito. The incubation period of dengue is generally 5-7 days (Rigau-Perez et al, 1998), hence the theoretical possibility of being bitten by an infected mosquito exists. However, this possibility is remote as the baby was closely wrapped and transferred to the NICU immediately after birth, keeping little skin exposed, and the NICU is a well-netted area. The possibility of direct contact from maternal viremic blood (by ingestion, respiratory route or through breach in the skin) has been mentioned (Thaithumyanon et al, 1994), and we could not rule out this route of virus transmission during the LSCS. In our case, the hypothesis of vertical infection as opposed to the postnatal infection was based on the following aspects: (1) confirmed maternal infection close to delivery time; (2) 5-day incubation period; (3) absence of *Aedes aegypti* focuses nearby the hospital and absence of other cases of dengue.

With the emergence of dengue epidemic, more number of pregnant women are at risk of dengue infection. Increasing number of cases of perinatal transmission of dengue fever is being reported from various countries. Though secondary infection is more serious, if the mother gets the primary infection in late pregnancy both mother and newborn are at risk of life threatening

complications. When mother is acutely ill with dengue at or near the time of delivery, it has been hypothesized that there is an insufficient level of protective maternal antibodies (IgG) transferred to the fetus and the newborn can manifest serious dengue disease (Janice Pérez-Padilla.,2011). When mother is affected earlier, the transferred maternal antibodies may initially be protective but as their level wanes they may predispose the infant to severe disease. Low

birth weight babies were found to have lower levels of transferred antibodies (Perret C.,2005). The onset of fever in the newborn varied from 1 to 11 days after birth with an average of 4 days and lasted 1-5 days (Sirinavin S.,2004). Presenting features are usually fever, lethargy, poor feeding, enlarged liver, thrombocytopenia, bleeding manifestations, circulatory insufficiency. Large intra-cerebral bleed and death has been reported (Joon K. Chye.,1997).

**Table.1** Initial Laboratory Report :

	<b>Mother on postoperative day 2</b>	<b>Newborn on Day 5 after birth</b>
Hemoglobin(Hb)	11.8gm/dl	15.1gm/dl
Platelets	90000/cmm	2,30,000/cmm
Total leucocyte count	3100/cmm	7200/cmm
Renal function test	-	Creatinine-0.2mg/dl BUN-6.0mg/dl
Dengue Serology	NS1-Positive IgG/IgM-Negative	NS1-Positive. IgG/IgM-Negative

**Table.2**

	<b>Mother on postoperative day 5</b>	<b>Newborn on Day 8 after birth</b>
Hemoglobin(Hb)	13.4gm/dl	15.6gm/dl
Platelets	25,000/cmm	14,000/cmm
Total leucocyte count	7300/cmm	6500/cmm

**Table.3**

	<b>Mother on postoperative day 9</b>	<b>Newborn on Day 13 after birth</b>
Hemoglobin(Hb)	12.5gm/dl	12.5gm/dl
Platelets	2,55,000/cmm	95,000/cmm
Total leucocyte count	7100/cmm	15700/cmm

**Table.4** Case reports of dengue in pregnant women and newborns in the last 5 years with

description of patients' symptoms

References	Country	Number of cases	Pregnant women symptoms	Newborn symptoms
Sirinavin et al.	Thailand	2	Thrombocytopenia and elevated liver enzymes	Fever, thrombocytopenia, elevated liver enzymes, bleeding, and rash
Phongsamart et al.	Thailand	3	Erythematous rash and thrombocytopenia	Fever, petechiae, and hepatomegaly
Petdachai et al.	Thailand	1	Fever and thrombocytopenia	Thrombocytopenia, leukopenia, petechiae, and hepatomegaly
Janjindamai & Pruekprasert	Thailand	1	Fever	Thrombocytopenia and elevated liver enzymes
Choudhry et al.	India	4	No information	Fever, lethargy, shock, and thrombocytopenia
Witayathawornwong.	Thailand	1	Thrombocytopenia and pleural effusion	Fever, thrombocytopenia, and pleural effusion
Restrepo et al.	Columbia	22	No report	Preterm delivery, fetal malformations, and low birth weight
Fatimil et al.	Bangladesh	1	Bleeding and pleural effusion	Fever and thrombocytopenia
Chotigeal et al.	Thailand	2	Postpartum hemorrhage	Thrombocytopenia and pleural effusion

In our case baby had lethargy and grunting with severe thrombocytopenia. In spite of the severe thrombocytopenia there was no intra-cranial bleed. The time interval between the beginning of fever in the pregnant woman and NB in the cases mentioned below ranged between 1 to 13 days (mean time = 7 days), which is similar to our case (Petdachai W.,2004).

**Case reports of dengue in pregnant women and newborns in the last 5 years with description of patients' symptoms**

In spite of the severe thrombocytopenia there was no intra-cranial bleed. DHF and DSS are postulated as being caused by antibody- dependent enhancement of

secondary dengue infection and, in an infant with postnatal primary dengue infection, as being enhanced by a passive maternal dengue antibody (Halstead SB.,2002). Immunopathogenesis of vertical dengue infection in neonates has not been established.

**Conclusion**

Pediatricians caring for newborns with Dengue fever should carefully observe the baby for a minimum period of two weeks before discharging them. Vigilant monitoring and proper hydration can lead to uneventful recovery from this potentially lethal condition. Clinicians caring for pregnant women should have a high index

of suspicion for early diagnosis of Dengue fever and timely referral to a tertiary center for proper management. This can prevent maternal and neonatal deaths. Newborn presenting with skin/mucosal bleed without any maternal history, possibility of dengue has to be considered

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