

## Case Series

# Neonatal Dengue Hemorrhagic fever and shock syndrome - A Case Series

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### Introduction

Dengue fever is an acute febrile illness caused by four serotypes of Dengue virus and in older children characterized by biphasic fever, myalgia, arthralgia, rash and leucopenia. Dengue hemorrhagic fever (DHF) is characterized by hemoconcentration, abnormality of hemostasis and in severe cases by a fluid & protein losing shock syndrome (Dengue Shock Syndrome, DSS). This arthropod born virus is transmitted by a daytime biting mosquito *Aedes aegypti*. There is no cross protection between the 4 dengue serotype but there is cross reaction<sup>1</sup>. The disease usually establishes a pattern of epidemic activity every 2-5 years. DHF and DSS are usually confined to children with a modal age at hospitalization of 4-6 years<sup>2</sup> and is uncommon in infants as they are exposed to Dengue virus infection usually for the first time. The literature regarding Neonatal DHF & DSS is confined to case reports. Herewe report four cases of neonatal DHF/ DSS which were treated during three month period. Age at admission was day 6, 8, 12 and 22 days in them.

#### Case 1

A 8 day old term neonate brought with abdominal distension and poor feeding. Mother expired in immediate postpartum period with high grade fever and seizures. Baby investigated and treatment was initiated for bacterial sepsis. Baby developed erythematous rash over distal limbs on day 2 of admission. Dengue fever was suspected due to rash, thrombocytopenia, hepatomegaly, shock and negative CRP results. Dengue Serology was positive for NS1 Ag and IgM, which was confirmed with ELISA. Baby received platelet transfusions and supportive treatment and baby could be discharged on day 10 of admission.

#### Case 2

A 6 day old neonate who presented with fever and one episode of seizure. Mother had fever 2 days prior to delivery. Baby had thrombocytopenia, bacterial cultures

were negative. Dengue work up was positive for NS1 Ag. Baby had bleeding tendency, managed with supportive care and platelet transfusion. Baby could be discharged on day 7 of admission.

#### Case 3

A 12 days male presented with fever, poor feeding. At admission baby had respiratory distress, poor perfusion, abdominal distension, hepatosplenomegaly. On investigation had raised CRP, leucopenia, thrombocytopenia and coagulopathy. Work up for Dengue was positive for IgM antibodies by ELISA. In spite of aggressive support baby succumbed to persistent shock and ARDS.

#### Case 4

A 22 days old neonate, got admitted for fever, lethargy. Baby had hepatomegaly, leucopenia, thrombocytopenia. Work up for Dengue is positive for NS1 Ag, IgM antibodies. Baby improved with supportive treatment

### Discussion

Infection with dengue virus generally results in a spectrum of disease. The spectrum ranges from dengue fever which is characterized by fever, myalgia, arthralgia, leucopenia and lymphadenopathy to DHF and shock syndrome<sup>3</sup>.

WHO criteria for defining DHF includes (a) fever, (b) hemorrhagic tendency (c) thrombocytopenia (d) evidence of plasma leakage (manifested by either a rise in the hematocrit equal to or greater than 20% above average for age, sex and population or signs of plasma leakage such as pleural effusion, ascites and hypoproteinemia). All the four above criteria for DHF plus evidence of circulatory failure (manifested by rapid and weak pulse, narrow pulse pressure (less than 20 mmHg), hypotension for age or cold, clammy skin must be present<sup>2</sup>.

Both DHF and DSS occur with high frequency in two immunologically defined groups: children who have experienced a previous dengue infection, and infants with waning levels of maternal dengue antibody. There are various studies which reported the rarity of dengue in early infancy and neonatal period<sup>2</sup>

23% cases of DHS/DSS was in 0-3 years age group during an epidemic in Delhi in 1996, where the youngest child was 3-months old<sup>4</sup>. And in Calcutta in 1990 no case of DHF/DSS was reported in infancy<sup>5</sup>.

DHF/DSS is uncommon in children below 1 year who are usually exposed to infection by dengue virus for the first time. However, if the mother is previously infected by dengue virus and hence has already developed antibody against that virus the infant may have placentally transmitted antibodies and may develop DHF after the first infection by dengue virus of antigenically different type.

This can be explained on the basis of immune enhancement theory also. According to this theory DHF/DSS occurs as a result of enhanced replication of virus in presence of preexisting antibody against another dengue serotype<sup>5</sup>.

Most cases have been noted to occur when dengue type 2 infects either a baby with maternal antibody against dengue or a child with serological evidence of having been infected during the previous 5 years with a heterogeneous dengue serotypes<sup>5-7</sup>.

#### Conclusion

DHS and DSS can occur in neonates. High index of suspicion is needed during the epidemic season in neonates presenting with features of sepsis, especially if there is early onset third spacing, thrombocytopenia and organomegaly.

#### Conflict of interest

None

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#### References

1. Rajajee S. Dengue Hemorrhagic fever—the need for awareness. *IAPJ Practical Pediatr* 1995; 2: 131-135.
2. World Health Organization—Dengue Hemorrhagic fever—Diagnosis, treatment, prevention and control; Geneva 1997 pp 5-7 and pp 34.
3. Sarin YK, Singh S, Singh T. Dengue viral infection. *Indian Pediatr* 1998; 35: 129-137.
4. Agarwal A, Chandra J, Aneja S, Patwari AK and Dutta AK. An epidemic of dengue hemorrhagic fever and dengue shock syndrome in children in Delhi. *Indian Pediatr* 1998; 35: 727-732.
5. Banik GB, Pal TK, Mandal A, Chakraborty MS, Chakravarti SK. Dengue hemorrhagic fever in Calcutta. *Indian Pediatr* 1994; 31: 685-687.
6. Chatterjee SN, Chakravarti Sk, Chakraborty NS, Ray S, Pal SR, Sarkar JK. Re-survey of arbovirus antibody in the human sera after an interval of six years. *Indian J Med Res* 1969; 57: 1629-1635.
7. Sumaro W, Jahaja E, Gubhr DJ, Suhayono W, Scoronsln K. Clinical operation on viro-logically confined fetal dengue infection in Jakarta, Indonesia, *bull WHO* 1983; 61: 693-701.