NEONATAL DENGUE

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Case scenario

- A 23 yr old antenatal mother with 37 weeks gestation was admitted with complaints of fever, headache, myalgia for 3 days.
- Detected to have hepatomegaly and bilateral pleural effusion.
- Delivered normally on third day of admission (6th day of fever).
- Female baby - 2.7 kgs and APGAR - 7/10, 9/10.
- Mother had severe post partum hemorrhage requiring repeated transfusions.
## Initial Laboratory Report

<table>
<thead>
<tr>
<th>Test</th>
<th>Mother</th>
<th>Newborn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin</td>
<td>9.5</td>
<td>14.6</td>
</tr>
<tr>
<td>Platelets</td>
<td>50,000</td>
<td>2,36,000</td>
</tr>
<tr>
<td>Total count</td>
<td>7170</td>
<td>15,400</td>
</tr>
<tr>
<td>ALT</td>
<td>400U/L</td>
<td></td>
</tr>
<tr>
<td>Bilirubin Total</td>
<td>2.2mg/dl</td>
<td></td>
</tr>
<tr>
<td>RFT</td>
<td>normal</td>
<td></td>
</tr>
<tr>
<td>Dengue Serology</td>
<td>NS1, Ig M + / Ig G -ve</td>
<td>Negative</td>
</tr>
<tr>
<td>PT</td>
<td>23.8sec</td>
<td></td>
</tr>
<tr>
<td>APTT</td>
<td>42.2sec</td>
<td></td>
</tr>
<tr>
<td>INR</td>
<td>2.35</td>
<td></td>
</tr>
</tbody>
</table>
On D3 the baby was admitted in NICU with complaints of fever (39.5°C), and icterus up to thighs. Liver was palpable 2 cm below the costal margin.

Suspecting EOS, sepsis screen was sent and baby was put on I/V antibiotics.

- Blood group B+ve (mother’s blood group A+)
- Baby was kept under phototherapy for 2 days (Sr. Bilirubin 13mg/dl on D5)

<table>
<thead>
<tr>
<th></th>
<th>Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb</td>
<td>17.6 mg/dl</td>
</tr>
<tr>
<td>PCV</td>
<td>51</td>
</tr>
<tr>
<td>TLC</td>
<td>4400/cu.mm</td>
</tr>
<tr>
<td>Platelets</td>
<td>1,56,000/cu.mm</td>
</tr>
<tr>
<td>Sr.bilirubin</td>
<td>15.9 mg/dl (direct 0.6 mg/dl)</td>
</tr>
</tbody>
</table>
• She was monitored carefully in the following days.
• Baby had fever for the next three days after which fever settled by Day 7.
• There was no evidence of any bleeding manifestations.
• Blood culture did no show any growth, so antibiotics were stopped.
• She was on full breast feeds and shifted to the mothers side on D8.

<table>
<thead>
<tr>
<th>Day 3 – Newborn</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue <strong>NS1 was positive</strong></td>
<td>Ig M and Ig G negative</td>
</tr>
</tbody>
</table>
On D11 baby was brought again with complaints of fever (Temp 39°C), poor feeding and lethargy.

On examination - Liver was palpable 6cms, there were few petechial lesions noted over the face and trunk.

<table>
<thead>
<tr>
<th></th>
<th>Day 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb</td>
<td>13.2mg/dl</td>
</tr>
<tr>
<td>PCV</td>
<td>43</td>
</tr>
<tr>
<td>TLC</td>
<td>4,900/cu.mm</td>
</tr>
<tr>
<td>Platelets</td>
<td>10,000/cu.mm</td>
</tr>
</tbody>
</table>

She was transfused platelets for 3 consecutive days, but there was no significant raise in platelet count.

Serial USG cranium did not show any intracranial hemorrhage.

No pleural effusion in X-ray chest.
Hemodynamically she was stable, but lethargic for three days and was on NG feeds and I/V fluids.

With the return of temperature to base line (Day 14), she became more alert and started feeding well.

Liver size started regressing and platelet count started rising from day 14.

<table>
<thead>
<tr>
<th></th>
<th>Day 12</th>
<th>Day 13</th>
<th>Day 14</th>
<th>Day 15</th>
<th>Day 19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb</td>
<td>12.4</td>
<td>11.1</td>
<td>10.6</td>
<td>9.0</td>
<td>10.7</td>
</tr>
<tr>
<td>PCV</td>
<td>39</td>
<td>35</td>
<td>33</td>
<td>28.6</td>
<td>34.6</td>
</tr>
<tr>
<td>TLC</td>
<td>6,500</td>
<td>7,400</td>
<td>14,700</td>
<td>16,800</td>
<td>11,780</td>
</tr>
<tr>
<td>Platelets</td>
<td>12,400</td>
<td>6,300</td>
<td>8,300</td>
<td>29,000</td>
<td>1,13,000</td>
</tr>
</tbody>
</table>

She was discharged on day 20.
DISCUSSION - DENGUE FEVER

• Acute febrile illness caused by Dengue virus (Flaviviridae genus)
• Arthropod borne virus.
• Spread by daytime biting Aedes aegyptii mosquito.
• 4 serotypes – DEN1, DEN2, DEN3, DEN4.
• There is no cross protection between the 4 serotypes.
• Secondary Dengue with other serotypes usually manifest much more severe illness.
• The incubation period is normally 3-8 days.

• The virus is detectable 6-18 hrs before the onset of symptoms.

• Viremia ends as the fever abates.
New classification - TDR, WHO 2009

**DENGUE ± WARNING SIGNS**

- with warning signs
- without

**SEVERE DENGUE**

1. Severe plasma leakage
2. Severe haemorrhage
3. Severe organ impairment

**CRITERIA FOR DENGUE ± WARNING SIGNS**

- Probable dengue
  - live in / travel to dengue endemic area.
  - Fever and 2 of the following criteria:
    - Nausea, vomiting
    - Rash
    - Aches and pains
    - Tourniquet test positive
    - Leukopenia
    - Any warning sign

- Laboratory-confirmed dengue
  - (important when no sign of plasma leakage)
  - *Warning signs*:
    - Abdominal pain or tenderness
    - Persistent vomiting
    - Clinical fluid accumulation
    - Mucosal bleed
    - Lethargy, restlessness
    - Liver enlargement >2 cm
    - Laboratory: increase in HCT concurrent with rapid decrease in platelet count

**CRITERIA FOR SEVERE DENGUE**

- Severe plasma leakage leading to:
  - Shock (DSS)
  - Fluid accumulation with respiratory distress

- Severe bleeding as evaluated by clinician

- Severe organ involvement
  - Liver: AST or ALT >= 1000
  - CNS: Impaired consciousness
  - Heart and other organs
Vertical Transmission of Dengue

• The first reported neonate of Vertical dengue infection was born in 1989 in Tahiti.

• 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.\(^1,2\)

• 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.\(^2\)
• 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.³

• Presenting features are usually fever, lethargy, poor feeding, enlarged liver, thrombocytopenia, bleeding manifestations, circulatory insufficiency. Large intra-cerebral bleed and death has been reported.⁴

• In our case baby had a bi-phasic fever with petechiae, hepatomegaly, extreme lethargy and severe thrombocytopenia which developed with the second spike of fever.

• In spite of the severe thrombocytopenia there was no intra-cranial bleed.
Interpretation of dengue serology

<table>
<thead>
<tr>
<th>IgM</th>
<th>IgG</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>Negative</td>
<td>Early sample / Not Dengue</td>
</tr>
<tr>
<td>Negative</td>
<td>Positive (Low titer)</td>
<td>Past Dengue infection</td>
</tr>
<tr>
<td>Negative</td>
<td>Positive (High titer)</td>
<td>Secondary Dengue</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
<td>Primary Dengue infection</td>
</tr>
<tr>
<td>Positive</td>
<td>Positive (Low titer)</td>
<td>Current / Recent primary Dengue</td>
</tr>
<tr>
<td>Positive</td>
<td>Positive (High titer)</td>
<td>Secondary Dengue Infection</td>
</tr>
</tbody>
</table>
Take Home Messages

• Bi-phasic fever has not been previously reported in other case reports. 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
Literature Review


Thank You

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