A peculiar case of dengue hemorrhagic fever: A case report of radical outcomes: A case study

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A Peculiar Case of Dengue Hemorrhagic Fever: A Case Report of Radical Outcomes

Neelam Ubaid-Ur-Raheem*1, Arusa Lakhani2, Amber Sabeen3

Abstract

Dengue is the arthropod-borne flavivirus infection, its severity increases during pregnancy, and results in worst maternofetal outcomes, which is an alarming issue. Dengue fever (DF) is the most common cause for preterm delivery and abortion. Dengue-related thrombocytopenia increases the risk of bleeding during pregnancy and delivery and can also leads to high maternal mortality rates. Globally 3.9 billion people are at risk of dengue fever, especially in Asia.

This case study focuses on a 22-years old pregnant woman from Pakistan without known co-morbidities. She presented in an emergency department with high fever, nausea, vomiting, and bleeding gum. She was positive for dengue and malaria. Due to the emergence of warning sign and symptoms, rapidly decreasing platelets, deranged coagulopathy, liver and renal profile, the baby was delivered by spontaneous vaginal delivery. The woman went into post-partum hemorrhage (PPH), and due to concealed bleeding needed multiple transfusions, vaginal packaging, and balloon tamponade. She developed multiple organ failure and was on continuous renal replacement therapy (CRRT). On day eight in intensive care unit, life support was withdrawn at the family’s request, and she died.

This case report of a failure to save a pregnant woman’s life highlights the importance of being alert to early warning signs, establishing an early diagnosis, timely interventions, close monitoring, and critical consideration of physiological changes of pregnancy are important for diagnosing infectious diseases such as dengue and malaria early, especially when both infections happen at the same time. In this case the baby survived but the woman sadly died.

Key Words: Dengue Fever, Maternal Mortality, and Post-Partum Hemorrhage

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Introduction

Dengue fever (DF) is the arthropod-borne flavivirus infection, putting a major economic burden on low-income countries and one of the causes of mortality. It is one of the most prevalent viral infections, with several outbreaks recorded each year. The incidence of DF has significantly increased over the past few decades. An estimated 3.9 billion people are at risk of dengue infection globally, and Asia is the most affected part. Research in Pakistan found 2,612 out of 11,283 (23.1%) dengue cases were reported in the age group 21-30. The high incidence in the adult population in Pakistan renders the pregnant women at high risk of dengue infection.

DF is defined as an acute illness with one or more of the following sign and symptoms: myalgia, arthralgia, retro-orbital pain, skin rash, headache, leukopenia, and hemorrhagic manifestations. Its severity increases during pregnancy, and results in worst maternofetal outcomes, which is an alarming issue and recently highlighted. In some cases, severe dengue is also occurring which is known as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Pregnant women are at high risk of DF, and it is the most common cause for preterm delivery and abortion. Dengue-related thrombocytopenia increases the risk of bleeding during pregnancy and delivery and can also leads to high maternal mortality rates. Prematurity and post-partum hemorrhage (PPH) are significant risks to mother and baby. Incidence of PPH was reported as 10% and 19% with dengue infection.

Case Presentation

A 22-year-old Pakistani woman, G1 34 weeks’ gestation, not-known co-morbidities (NKCM), residence of Hyderabad, presented in emergency department (ED) with high grade fever for one week, and bleeding from gums. Patient had nausea and vomiting, with these complaints she was taken to secondary care hospital, where she was registered and receiving regular antenatal care, she tested positive for dengue and malaria, where she was conservatively managed and referred to tertiary care hospital. Her laboratory results are listed in Tables 1-2.

On arrival in ED, she was drowsy, arousal, but confused (GCS 14/15), febrile (102 °F), heart rate was 102/min, respiratory rate was 24/min, and blood pressure was
100/68 (67 mmHg). She was resuscitated with fluids at 5-10 ml/kg/hr., 1-2 hours and then 3-5 ml/kg/hr as a maintenance and multiple transfusions was done as patient was severe anemic (hemoglobin was 6.9), and in lactic acidosis, (lactate was >14). Antipyretic Paracetamol 1G and antiemetic Ondansetron 50 mg was given. She had one episode of coffee ground vomiting in ED. Cardiac and respiratory examination was unremarkable. Abdominal examination revealed a soft abdomen with a single live fetus.

**Table 1:** Laboratory examination results in case study (ABG, CDC & electrolytes)

<table>
<thead>
<tr>
<th>ABG’s Profile</th>
<th>Results</th>
<th>CBC Profile</th>
<th>Results</th>
<th>Electrolytes</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H (7.35-7.45)</td>
<td>7.29</td>
<td>Hb (11-14.5)</td>
<td>6.9 g/dl</td>
<td>BUN (6-20)</td>
<td>23 mg/dl</td>
</tr>
<tr>
<td>PCO₂ (32-45)</td>
<td>18.50 mmHg</td>
<td>HCT (34.5-45.4)</td>
<td>23.4%</td>
<td>CR (0.6-1.1)</td>
<td>1.3 mg/dl</td>
</tr>
<tr>
<td>PO₂ (83-108)</td>
<td>112.80 mmHg</td>
<td>RBC (3.61-5.2)</td>
<td>2.54 x10E12/L</td>
<td>NA (136-145)</td>
<td>137 mmol/L</td>
</tr>
<tr>
<td>BIC (19-24)</td>
<td>8.60 mEq/L</td>
<td>MCHC (30.3-34.4)</td>
<td>29.5 g/dl</td>
<td>K (3.5-5.1)</td>
<td>4.4 mmol/L</td>
</tr>
<tr>
<td>Base Excess (-2-3)</td>
<td>-15.3 mEq/L</td>
<td>WBC (4.6-10.8)</td>
<td>7.1 x10E9/L</td>
<td>Mg (1.6-2.6)</td>
<td>2.8 mg/dl</td>
</tr>
<tr>
<td>O₂ SAT (94-98)</td>
<td>97.40%</td>
<td>PLT (154-433)</td>
<td>5 x10E9/L</td>
<td>BIC (20-31)</td>
<td>8.6 mmol/L</td>
</tr>
</tbody>
</table>

**Table 2:** Laboratory examination results in case study (LFT, coagulation & others)

<table>
<thead>
<tr>
<th>LFT’s Profile</th>
<th>Results</th>
<th>Coagulation</th>
<th>Results</th>
<th>Others</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>GT &lt;38</td>
<td>23 IU/L</td>
<td>PT (9.3-12.8)</td>
<td>14.9 sec</td>
<td>PROCAL &lt;0.5</td>
<td>12.30 ng/mL</td>
</tr>
<tr>
<td>SGPT (ALT) &lt;35</td>
<td>222 IU/L</td>
<td>INR (0.9-1.2)</td>
<td>1.4 ratio</td>
<td>TROP-I (0-37)</td>
<td>11 ng/L</td>
</tr>
<tr>
<td>AP (45-129)</td>
<td>143 IU/L</td>
<td>APTT (22.9-34.5)</td>
<td>102.7 sec</td>
<td>GLUR (80-160)</td>
<td>36 mg/dl</td>
</tr>
<tr>
<td>SGOT (AST) &lt;35</td>
<td>1037 IU/L</td>
<td>Comments</td>
<td>NIL</td>
<td>SARS-CoV-2</td>
<td>Not Detected</td>
</tr>
</tbody>
</table>

Cardio-tocography (CTG) was normal. Ultrasound (US) abdomen showed free fluid in the abdomen and pelvis. The diagnosis was made as DHF grade III and shifted to the intensive care unit (ICU) for further management.
On first day in ICU, patient GCS was 14/15, on nasal prong at 3 liters’ oxygen. She developed two episodes of hematemesis, mild intermittent abdominal pain, and hypochondriac tenderness. On scanning, the gestational age was identified as 34 weeks and 3 days, the amniotic fluid index (AFI) was 4.8, and weight of baby 2.3 kg. Due to the beginning of warning sign and symptoms, and deranged coagulopathy, gynecology and ICU team decided to plan for induction of spontaneous vaginal delivery (SVD) under multiple transfusions. The multidisciplinary team approach the family and explained the whole procedure and high risk of intubation and 70% chances of maternal mortality and intra-uterine death due to thrombocytopenia and deranged coagulopathy. Family was also explained regarding the preterm, low birth weight, complications due to prematurity, such as, respiratory distress, hypothermia, and high risk of acquiring dengue and malaria.

On second day in ICU, after getting consent, the multidisciplinary team decided to induce the SVD in ICU setting, as there was a high risk of deterioration during the transport from ICU to the delivery room. FFP’s were transfused before the SVD induction, and five mega units were arranged to be transfused before the procedure. After the detailed counselling and consent, through SVD induction, the premature baby girl was delivered in ICU with Apgar score of 8 and 10 and at 1 and 5 minutes, respectively. Baby was sent to the neonatal intensive care unit for initial assessment, observation, and nutrition. The baby tested negative for dengue infection. Patient had developed PPH, bleeding about 400-500 ml after SVD, for which multiple transfusions and vaginal packing were done due to active oozing from vaginal lacerations. She was identified with multiple active issues which includes, severe dengue, complicated malaria, thrombocytopenia, hypoxic respiratory failure (HRF), lactic acidosis (LA), acute liver failure, acute kidney injury, gastrointestinal (GI) bleed, melena, and severe per vaginal (PV) bleed.

After SVD, patient had three episodes of hematemesis, developed respiratory distress and high anion gap metabolic acidosis (HAGMA). She was electively intubated and was on higher settings of mechanical ventilation (MV). Patient became hypotensive and dropped urine output. The coagulation profile was severely deranged despite of multiple transfusions routinely. The liver profile was also deranged for which N-Acetylcysteine (NAC) was given. She was in refractory lactic acidosis and needed
continues renal replacement therapy (CRRT). Gradually she developed DHF and DSS.

On third day in ICU, US of bladder showed 200ml bladder clots and hematuria, the bladder could not be washed out due to the patient’s critical condition, she was receiving continuous bladder irrigation. Patient was on CRRT, had massive PV bleeding and the gynecology team wanted to move the patient to the operating room (OR) for vaginal balloon tamponade, but due to continuation of CRRT and inotropic support, this procedure was done in ICU. After receiving multiple blood transfusions, the patient Hb was static to 4.4 and with deranged coagulation profile.

On sixth day in ICU, the balloon was removed as patient did not have any sign of bleeding, but on the very next day the bleeding started again, so the multiple transfusions were done, and gynecology team done the vaginal balloon tamponade again in ICU. CRRT had been stopped but patient need renal clearance for which intermittent dialysis were done.

On eight days in ICU, inotropic support was hold, urine output was picked, and hematuria resolved. Sedation vacation was given to the patient, but she did not regain the GCS. Family was counselled in detail for tracheostomy and long-term ventilation, but they denied to keep the patient on ventilator and for further procedures and decided for withdrawal code. The patient was withdrawal, and she was expired immediately. Patient had total nine days stay in hospital and undergone several invasive and non-invasive treatments. The baby girl was discharged to the home on formula feeding after six days as she was doing well.

Discussion

Dengue infection present with a febrile period of two to seven days followed by three to four days of defervescence phase leading towards the shock due to massive plasma leakage. In this case study, the woman presented in ED after seven days of fever. The patient hematocrit (HCT) level was high which is indicating the state of shock and low tissue perfusion.

Complications of dengue infection depends on a combination of host and viral virulence. The dengue virus replicates intracellularly and triggers an antigen-antibody complex causing immune-mediated cell destruction and production of cytokines and antibodies. In our case the patient was positive for NS1 antigen, with severe thrombocytopenia, and elevated liver enzymes. Irrespective of prophylactic platelet
transfusion, research studies also reported the sign of clinical bleeding in dengue patients due to a complicated effect on the hemostatic system.\textsuperscript{4}

The clinical assessment, diagnosis, monitoring, and treatment of DF or DHF during pregnancy can be challenging due to the numerous physiological changes arising in pregnancy and obstetric complications imitating a clinical presentation of dengue infection. Fever with low platelets count, deranged liver functioning profile, right hypochondriac pain can be a part of hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome or dengue illness.

The effects of dengue during and on pregnancy are unclear. There is a lack of obvious reference regarding female of reproductive age who live and travel to endemic areas are at high risk for acquiring dengue. The literature suggests that in low-income countries, adverse maternal outcomes in females with symptomatic dengue are evident.\textsuperscript{7}

A pregnant woman with obvious sign of DF needs rigorous medical surveillance. The consideration towards the practices of caesarean section as compared to normal delivery in dengue is important to reduce the incidence of PPH.\textsuperscript{5} In our case the SVD was induced with low platelet counts, due to the severity of the condition as patient cannot be transferable to OR or any other entity for any procedure due to high inotropic support and continuation of CRRT. Though, the caesarean section (CS) was the most preferable mode for this patient after the elective intubation, along with following the massive transfusion protocol due to thrombocytopenia and the initiation of CRRT immediately after the CS, as the patient was in metabolic acidosis from the very first day in ED and the transfusion of platelets should be continuing until reached 50,000 /uL. In our case, general condition of the patient was not favorable for her to tolerate SVD. It was only because mother was falling critically ill, and a decision of multidisciplinary team was considered in urgent situation.

Early administration of CRRT results in positive maternal and fetal outcomes. Consequently, CRRT treatment can improve the renal functioning and intrauterine environment of pregnant women with hemorrhagic fever with renal syndrome (HFRS) and increasing the incidence of successful outcomes of pregnancy. Though, the optimal timing and indication of CRRT in pregnant women should explored immediately.\textsuperscript{7} In our case, the CRRT initiation was delayed though patient...
developed multiple organ failures (MODs) and critically ill.

PPH in dengue patient can occur due to polyhydramnios. Treatment with uterotonic drugs is important for myometrium contraction and act as a major factor preventing blood loss after SVD. In our case, there is no such uterotonic drug management was done for the patient.

Dengue infection in pregnancy, increases the risk of miscarriages, high risk of bleeding, premature labour, low birth weight, maternal and neonatal morbidity, and mortality. In our case the premature, low-birth baby was delivered, the only achievement was the delivery of baby girl without any vertical transmission and discharge to home. Although, the mother developed the PPH, oozing from the vaginal lacerations, massive bleeding, developed DSS, and end up in maternal mortality.

Conclusion

This case report explains that a high index of suspicion, early diagnosis, timely interventions, close monitoring, and critical considerations of physiological changes of pregnancy when interpreting clinical situation, led to achieve the desired outcomes in terms of saving life.

It is vital to develop and implement guidelines to screen, diagnose and manage dengue in pregnancy at earlier stages, permitting tailored prevention programs in obstetric population. A specific management of pregnant women with DF, specifically in last trimester, can prevent the risk of bleeding during pregnancy and premature delivery.

References


