Dengue Shock Syndrome: An Experience from a Tertiary Level Hospital in Mumbai

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ABSTRACT

Introduction: Dengue shock syndrome (DSS), the most common life-threatening complication of acute dengue, occurs when excessive capillary leakage precipitates circulatory dysfunction or collapse. In this report we present a case dengue who was later diagnosed as shock syndrome.

Case report: 40 year old male presented with complaints of fever with chills and generalized bodyache since three days, and vomitting since two days. The patient started noticing petechia two days after the onset of fever. On examination, petechiae were present over both the arms and vitals were within normal limits. Systemic examination revealed soft palpable spleen, shifting dullness which was suggestive of ascites. Routine hematological investigations revealed platelet count of 8000 at the time of presentation and high liver enzymes. Only dengue viral antigen test was positive in the virology panel. The diagnosis of dengue shock syndrome was made. The patient was started on injectable artesunate, ceftraixone, antiemetic, antacid and platelets were transfused. The patient showed signs of improvement from the second day and his platelet improved to 68,000 on the fourth day.

Conclusion: Dengue virus infection is associated with signifiacnt morbidity and mortality. Large prospective studies are required to understand, characterise the extend and mechanisms of DSS.

Keywords: Dengue, Shock, Petechiae

INTRODUCTION

Dengue is a vector-borne viral infection and a globally important public health problem. It is endemic in more than 100 countries of Asia, Africa, and Latin America with annually a modeled 50 to 100 million infections, 500,000 dengue hemorrhagic fever cases, and more than 20,000 deaths.[1] Symptomatic dengue virus infections can present with a wide range of clinical manifestations, from mild febrile illness to a life-threatening shock syndrome or organ dysfunction. Dengue shock syndrome (DSS), the most common life-threatening complication of acute dengue, occurs when excessive capillary leakage precipitates circulatory dysfunction or collapse. The pathophysiologic presentation of DSS (thrombocytopenia and relatively slow development of hypovolemia) is distinct from other infectious causes of cardiovascular shock.[2] Therefore a different approach is needed when managing such patients. Here we present a case of dengue patient who was diagnosed with dengue shock syndrome.

CASE REPORT

A 40 year old male presented to the emergency room, Jaslok Hospital and Medical Research Center, Mumbai, with complaints of fever with chills since and generalized bodyache since three days, and vomitting since two days. On taking detailed history, the patient revealed that he was apparently well three days back when he complained of fever, which was intermittent type and associated with chills. He noted that the fever subsided on taking anti-pyretic medication but returned after few hours. The patient started noticing petechia two days after the onset of fever. Patient also had a history of four episodes of vomitting which was watery and non projectile type. The patient did not give any history of diarrhea, burning micturation, headache or any other major illness or surgery in the past. On examination, petechiae were present over both the arms and vitals were within normal limits (figure-1). Systemic examination revealed soft palpable spleen, shifting dullness which was suggestive of ascites. Routine hematological investigations were ordered which revealed platelet count of 8000 at the time of presentation and high liver enzymes (table-1). Dengue viral antigen test came positive, otherwise malarial antigen, IgM leptospirosis, widal and dengue antibody came negative. Chest x-ray was suggestive of mild bilateral pleaural effusion (figure-2). Ultrasonography of the abdomen revealed moderate ascites, splenomegaly and gall bladder wall thickening. The diagnosis of dengue shock syndrome was made. The patient was started on injectable artesunate, ceftraixone, antiemetic and antacid. In addition the patient received L - Ornithine L - Aspartate 500 mg and platelets were infused in view of life threatening thrombocytopenia. The patient showed signs of improvement from the second day and his platelet improved to 68,000 on the fourth day. Patient was discharged after 9 days with normal platelet count and resolution of all symptoms.

DISCUSSION

In severe dengue, an acute increase in vascular permeability leads to plasma leakage (hemoconcentration), clinical effusions (pleural, pericardial, and peritoneal effusions; hydrops of the gallbladder), and hypotension. Hemorrhagic complications are usually mild (petechiae) but may be more severe (purpura, large ecchymoses, bleeding at sites of venipuncture, and gastrointestinal bleed).[3] DSS is due to intravascular hypovolemia from plasma leakage rather than from bleeding. In epidemics associated with virulent DENV serotypes, there are many severe primary dengue cases with hepatomegaly, high transaminases, and liver failure.[4] The World Health Organization criteria for dengue hemorrhagic fever are fever (2-7 days in duration or biphasic), minor or major hemorrhagic manifestations, thrombocytopenia (defined as platelet count less than 100,000/µL), and objective evidence of increased

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	Day 1	Day 2	Day 3	Day 5	Day 6	Day 8
Hemoglobin (mg/dL)	14.5	14	14.5	13.8	12	12.2
Total Leucocyte Count (per mm^3)	2800	3200	3000	4400	5800	6400
Platelet count (per microliter)	8000	14000	42000	68000	136000	200000
Blood Urea Nitrogen (mg/dL)	47	-	32	-	16	-
Blood Creatinine (mg/dL)	2.2	-	1.8	-	0.8	-
Bilirubin (mg/dL)	2	-	1.6	-	1	-
Aspartate Aminotransferase levels (u/L)	840	-	400	-	110	40
Alanine Aminotransferase levels (u/L)	678	-	320	-	90	35
Sodium (mEq/L)	131	-	136	-	142	-
Potassium (mEq/L)	3.4	-	3.8	-	4.1	-
Chloride (mEq/L)	102	-	105	-	108	-
Arterial Blood Gases	pH-7.26 PO_2-55 PCO_2-35 HCO_3-14	-	pH-7.4 PO_2-85 PCO_2-40 HCO_3-18	-	pH-7.42 PO_2-98 PCO_2-42 HCO_3-21	-
Malarial Antigen test	Negative	-	-	-	-	-
IgM Leptospirosis	Negative	-	-	-	-	-
Widal Test	Negative	-	-	-	-	-
Dengue NS1	Positive	-	-	-	-	-
Dengue IgM	Negative	-	-	-	-	-
Dengue IgG	Negative	-	-	-	-	-

Table-1: Investigations performed during admission of the patient

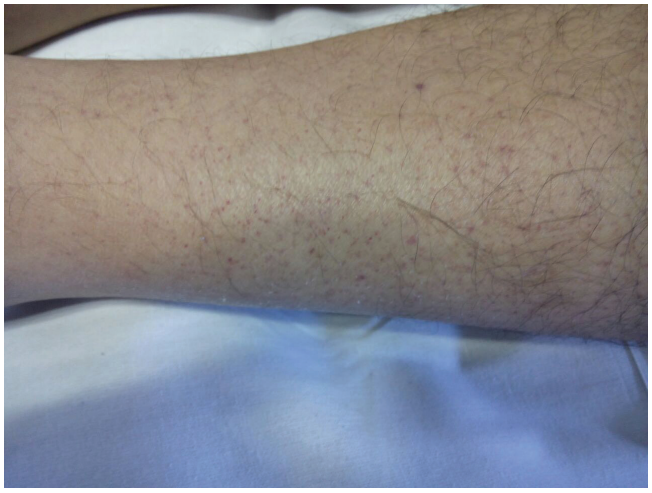

Figure-1: Petechiae observed in the patient

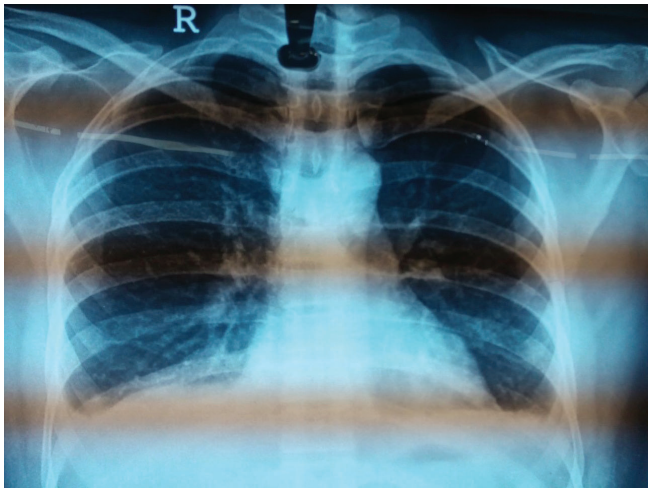

Figure-2: Chest x-ray findings of the patient

capillary permeability (hematocrit increased by ≥20%), pleural effusion or ascites (by chest radiography or ultrasonography), or hypoalbuminemia. DSS criteria include the above as well as hypotension, tachycardia, narrow pulse pressure (≤20 mm Hg), and signs of poor perfusion (cold extremities). Approximately 20-30% of cases of dengue hemorrhagic fever are complicated by shock (dengue shock syndrome). Thus DSS is accompanied by increased peripheral vascular resistance and raised diastolic blood pressure.[5]

Management of DSS includes urgent evaluation of vital signs and to check the level of hemoconcentration, dehydration, and electrolyte imbalance present in the patient. Close monitoring is essential for at least two days is essential, because shock may occur or recur even after complete resolution of fever.[6] Patients who are cyanotic or have labored breathing should be given oxygen. Replacement of intravenous fluids rapidly and maintaining electrolytes is the mainstay of management until spontaneous recovery starts to happen. Normal saline is more effective than the more expensive Ringer lactated saline in treating shock. Plasma or colloid preparations are indicated when pulse pressure is ≤10 mm Hg or when elevation of the hematocrit persists even after replacement of fluids.

CONCLUSION

The mortality rate for patients admitted with established DSS is 1% to 5%, even with the best available care. Again, the most important clinical feature of dengue is increased vascular permeability leading to DSS. Infants and young children are particularly prone to the development of shock, and adults are at increased risk of bleeding. Prompt but judicious fluid resuscitation in DSS is the most important therapeutic intervention. It is imperative that frequent measurements be made, patients be continuously assessed, and treatment be modified in light of the clinical situation and results

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