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CLINICAL BRIEF

Dengue Shock Syndrome with Two Atypical Complications

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Abstract The authors present 2 cases of dengue shock syndrome with unusual complications. In the first case, a 14-y-old boy with dengue shock syndrome who required aggressive fluid resuscitation, developed abdominal compartment syndrome (ACS). Patient developed severe shock, increased ventilator requirement and oliguria as a consequence of ACS. Patient responded well to abdominal paracentesis draining 2.7 l of fluid and made rapid recovery. In the second case, 8-y-old girl was treated for dengue shock syndrome, including mechanical ventilation for ARDS. In the second wk of illness, she developed severe neurological manifestations including frequent episodes of convulsions, hallucinations and altered sensorium. She was diagnosed to have acute demyelinating encephalomyelitis from CT brain findings. She responded well to pulse steroid therapy with complete neurological recovery.

Keywords Dengue · Abdominal compartment syndrome · ADEM

Introduction

As the spread of dengue fever and dengue hemorrhagic fever is increasing, atypical manifestations are also on the rise [1]. Recent observations indicate that the clinical profile of dengue is changing, and that neurological and other atypical manifestations are being reported more frequently [2–6]. There are very few reports available in the literature highlighting clinical course and management of acute demyelinating encephalomyelitis (ADEM) and abdominal compartment syndrome (ACS) in dengue infection. The authors present 2 cases of dengue hemorrhagic fever to highlight clinical features and management of these complications.

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Case Reports

Case 1

A 14-y-old boy was admitted with high fever since 8 d, vomiting, pain in abdomen and decreased urine output since 1 d. On admission, the systolic blood pressure was 70 mm Hg with poor perfusion requiring fluid rescusitation and inotropic support. Relevant investigations were done. Hematocrit was very high – Hb 20.7 g % , PCV 61.5 and platelet count was $110 \times 103/mm^3$. Dengue IgG was strongly positive, IgM was negative and blood bactec was negative. Radiograph chest revealed right pleural effusion.

Clinical picture and investigations suggested diagnosis of dengue shock syndrome. Patient was electively intubated and ventilated in view of poor perfusion and unstable hemodynamics. Patient required multiple fluid boluses and upward titration of inotrope and vasopressor support. Serial monitoring of PCV was done.PCV values were as follows: 61.5 at admission, 54.8 at 8 h, 50 at 10 h and 37 at 14 h of admission.

At 10 h of admission, patient had poor perfusion, cold peripheries, oliguria and severe hypertension with BP of

150/120 mm Hg suggestive of severe vasoconstriction. Also, abdomen felt very firm and rigid. Clinical picture suggested abdominal compartment syndrome. Ascitic tap was done and continuous ascitic drain was kept. Also, milrinone drip was started and adrenalin drip reduced to decrease vasoconstriction. Ascitic fluid drainage was continued. Patient responded well with improvement in perfusion and subsidence of severe hypertension. Approximately 2.7 l of ascitic fluid was drained, following which abdomen became soft. Patient was extubated after 24 h of ventilation and thereafter made an uneventful recovery.

Case 2

An 8-y-old girl was referred to the authors' hospital with history of fever since 6 d and one episode of hemoptysis following which she became breathless. On admission, she was cyanosed, restless with laboured breathing and therefore, was intubated and ventilated. On ET suctioning, fresh blood and blood stained secretions were suctioned. High ventilator settings were required to maintain adequate oxygen saturation (>90%). Radiograph chest done was suggestive of ARDS. Patient required PRBC, FFP and platelet transfusions. She also required fluids, dopamine and nor-adrenalin infusion to maintain adequate blood pressure and perfusion. PT/ PTT sent prior to giving any blood products was normal and platelet count was 87000/ mm^3. Dengue IgG was strongly positive whereas Dengue IgM was negative. Clinical picture and lab investigations suggested diagnosis of dengue shock syndrome. Inotropes were omitted on day 4 and patient could be weaned from ventilator on day 5 of admission.

Post extubation, child was doing well and had normal sensorium. However, 12 h post extubation, she had 2 episodes of generalised tonic clonic seizure. CBC and metabolic work up done were normal. Sensorium remained normal and loading dose of phenytoin was given. Next day, patient had multiple episodes of convulsions following which sensorium became altered with drowsiness, aggressive behaviour and hallucinations. Loading dose of phenobarbitone and IV valparin were given. Patient remained afebrile during these events.

CT scan of the brain was done which suggested bilateral frontal and occipital lobe hypodensities in the white matter suggested of demyelination. Pediatric neurologist's opinion was taken. In view of clinical picture and CT brain findings, diagnosis of ADEM was made. She was started on pulse dose intravenous methylprednisolone 30 mg/kg once a day for 3 d. She showed dramatic improvement and was completely normal neurologically after 2nd pulse dose of methylprednisolone. After 3 pulse doses of methylprednisolone, oral prednisolone was started in the dose of 2 mg/kg/day and given for a total of 14 d in a tapering dose. She was discharged after 15 d of hospitalization and was neurologically normal at discharge.

Discussion

Abdominal compartment syndrome (ACS) is being increasingly recognized following a variety of medical conditions like sepsis, dengue shock syndrome, acute pancreatitis *etc* [7].

In dengue shock syndrome, ACS occurs due to leakage of fluid from the intravascular compartment particularly after massive fluid resuscitation, leading to fluid accumulation in serous cavities. ACS can have deleterious effect on various organ systems. It can cause decreased cardiac contractility, increased afterload, increased ventilator requirement, decreased GI perfusion, renal dysfunction and oliguria and increased ICT [7]. Relieving high intraabdominal pressure leads to dramatic improvement in clinical condition [7].

Though the authors did not measure abdominal pressure, very firm and rigid feel of the abdomen and associated symptoms like severe shock, oliguria and increased ventilatory requirements and also, dramatic improvement after large volume abdominal paracentesis draining 2.7 l of fluid suggested the diagnosis of ACS. The present patient had severe vasoconstriction which could be explained by increased abdominal pressure with ACS causing decreased cardiac output, decreased cardiac contractility, pressure on the aorta and increased afterload. Severe vasoconstriction and cold shock responded to abdominal paracentesis and milrinone infusion.

Kamath and Ranjit [2] have reported in their study of 109 dengue patients admitted in PICU that 3 patients had abdominal compartment syndrome and it contributed to refractory shock. They reported improvement in cardiorespiratory function in 2 children following controlled release of the intra-abdominal pressure by peritoneal dialysis while the third patient failed to improve and died.

Various neurological complications have been reported in dengue fever. Pancharoen and Thisyakorn [8] published a study of 1483 patients with dengue fever, out of which eighty patients had neurological manifestation with an incidence of 5.4%. They were categorised into encephalopathy group (42), seizure group (35) and miscellaneous group (3).

Kamath and Ranjit [2] have reported in their study of 109 dengue patients admitted in PICU, that out of 24 patients with neurological manifestations, 2 had ADEM. They had profound altered mental status and no localizing signs despite normalization of their cardiopulmonary and metabolic parameters and subsidence of stigmata of DHF, similar to the case 2 in present study. Both patients were

treated with pulse dose of steroid. One patient progressed to severe cerebral edema and brain stem death while the second patient survived with significant neurological residua.

Yamamoto et al. [9] reported a case of ADEM in dengue fever in a 58-y-old male in the year 2001. In 2007, Brito et al. [3] reported a case of 37-y-old woman with ADEM due to dengue virus serotype 3. Miranda de Sausa et al. [4] reported in 2006 a case of Brazilian child with neuromyelitis optica, a rare form of ADEM following dengue infection. They reported benign evolution following steroid therapy. Recently, few case reports of ADEM in dengue infection have been reported [5, 6]. Gera and George [6] reported a case of dengue fever with ADEM in an adult male. He showed good clinical response to a course of high dose corticosteroid with complete neurological recovery.

Conflict of Interest None.

Role of Funding Source None.

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