

New Onset Diabetes Mellitus in Dengue Shock Syndrome

Sreenivasa Rao Sudulagunta¹,
Mahesh Babu Sodalagunta²,
Monica Kumbhat³,
Shiva Kumar Bangalore Raja⁴

¹Senior Resident in General Medicine, Dr. B.R. Ambedkar Medical College, K.G. Halli, Bangalore, Karnataka; ²Post Graduate in General Medicine, K.S. Hegde Medical College, Mangalore, Karnataka; ³Resident in Pathology, Sri Ramachandra Medical College, Chennai, Tamil Nadu; ⁴Professor of General Medicine, Dr. B.R. Ambedkar Medical College, Bangalore, Karnataka

Sir,
Dengue fever is a mosquito-borne tropical disease and the most common arboviral illness in humans. Worldwide around 2.5-3 billion people live in 112 countries that experience dengue transmission. Estimates suggest that number of people infected range from 50 to 528 million per year, resulting in approximately 0.5 million hospitalizations.^{1,2} Dengue hemorrhagic fever (DHF) is an endemic disease in India.² Four serotypes of dengue virus were documented till now which are DEN-1, DEN-2, DEN-3 and DEN-4.² Various common complications include encephalitis, myocarditis, acute motor weakness, Guillan-Barre like syndrome, acute liver failure, lupus erythematosus,

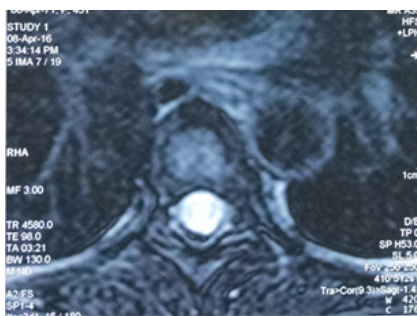


Fig. 1: MRI spine transverse section T2W image showing hyper intensity of cord at D6 level

haemophagocytic syndrome, acute kidney injury etc.

Two patients aged 30 years and 39 years were admitted in intensive care unit with history of fever and shortness of breath. No history of alcoholism was found. Patients were diagnosed with dengue fever as the NS1 antigen and dengue IgM antibody was positive. RT-PCR for dengue (reverse transcriptase- polymerase chain

reaction) was positive in both patients. Echocardiography was normal. Ultrasound abdomen revealed bulky and hypoechoic pancreas indicative of pancreatitis, fatty liver and ascites.

Computerized tomography of abdomen revealed diffusely enlarged pancreas with scattered non enhancing areas suggestive of necrosis, extensive peripancreatic fat stranding, moderate ascites and bilateral pleural effusion. On admission random blood sugars were high (>200mg/dl) in both patients without any history of diabetes mellitus. Glycosylated hemoglobin levels were 5.1 and 5 for both patients. Patient were diagnosed as severe dengue hemorrhagic fever with acute pancreatitis, new onset diabetes mellitus, acute kidney injury, and decompensated shock. Patient were discharged after repeat ultrasound abdomen showing reduction of pancreatitis and ascites.

Infection with one dengue serotype results in lifelong homotypic immunity and a very brief period of partial heterotypic immunity, but an individual can be infected by all 4 serotypes separately. Infection of target cells in reticuloendothelial system, such as dendritic cells, hepatocytes, and endothelial cells occur. The four cardinal features of dengue hemorrhagic fever (DHF) are increased vascular permeability, fever, hemorrhage, and marked thrombocytopenia (100,000 cells/mm³ or lower). Dengue shock syndrome (DSS) is usually characterized by a rapid, weak pulse with narrowing of the pulse pressure (<20 mmHg (2.7 kPa), regardless of pressure levels, e.g. 100/90 mmHg (13.3/12.0 kPa)) or hypotension with cold, clammy skin and restlessness.

Acute pancreatitis diagnosis was based on clinical features, history of epigastric pain, fever, abdominal tenderness, enlargement of the pancreas on ultrasound examination and CT abdomen with normal hepatobiliary function, increased serum amylase and lipase 3 times above normal. One series regarding DHF outbreak in taiwan (2002) reported pancreatitis (defined by a lipase level 3-fold greater) in three patients with acute DHF and few other reports from other asian countries.³ Acute pancreatitis causing diabetes mellitus is a very rare manifestation of dengue.⁴ The exact mechanism

of pancreatitis is not clear and was thought to be multifactorial.

Several hypotheses were proposed include direct inflammation, destruction of pancreatic acinar cells; autoimmune response to pancreatic islet cells with viral infection as a trigger, similarity between viral and islet cells antigens inducing autoimmune response, edema of the ampulla of vater causing obstruction to the outflow of pancreatic fluid. Aspartate aminotransferase (AST) levels are usually higher than alanine aminotransferase levels, possibly due to coexisting myositis and release of AST from injured muscle cells.

Serotypes 3 and 4 are associated with greater aminotransferase elevation. Liver biopsies in patients with DHF showed microvesicular steatosis, centrilobular focal necrosis, acidophilic bodies, kupffer cell hyperplasia, and mononuclear portal tract inflammation. Kidney injury might be due to glomerular injury caused by direct invasion of virus and deposition of immune complex in glomeruli. Dengue virus causing deposition of antigen-antibody complex in langerhan's cells has been found. This complication of pancreatitis and new onset diabetes is under-reported and lack of awareness may prove fatal to a patient in dengue shock syndrome (DSS).

References

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