HEPATIC DYSFUNCTION AND ACUTE RENAL FAILURE REQUIRING HAEMODIALYSIS IN DENGUE HEMORRHAGIC FEVER- A RARE COMPLICATION

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ABSTRACT: The incidence of dengue hemorrhagic fever is on rise and the associated mortality is high owing to multi-system failure. Standing at the verge of dengue epidemic, we are seeing more complicated version of the disease than the previous experiences. Although involvement of liver in dengue in the form of elevated hepatic enzymes is known, renal failure is a rare complication in the absence of other contributing etiology. Literature reviews quote a high mortality in dengue with renal failure mostly due to inappropriate or delayed management. We report two such cases of Dengue hemorrhagic fever wherein the patient went into hepatic and renal failure requiring dialysis. Both patients recovered following an intensive monitoring and timely dialysis. Since there are no definite guidelines for the management of renal failure in dengue, an appropriate management of these cases in the intensive care unit would help in reducing the associated morbidity and mortality.

KEY-WORDS: Dengue Hemorrhagic Fever, hepatic failure, renal failure

INTRODUCTION: Dengue Haemorrhagic Fever (DHF) is a leading cause of serious illness and death among children in some Asian countries.¹⁴ Acute renal failure (ARF) and hepatic failure have been reported as rare and potentially fatal complication of DHF in various reports worldwide.²–⁶ However, similar reports from India are limited.⁷ We report two cases of DHF at our center that developed ARF and hepatic dysfunction. Appropriate management and timely hemodialysis helped in complete recovery of both the patients.

Case History
Case 1
A 49-year female presented with fever, loose stools, vomiting and decreased urine output of 3 days duration. There was no history of rash or joint pain, burning micturition, cough or altered
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sensorium. She was recently diagnosed with type II diabetes mellitus, for which she was on diet control. Otherwise, there was no history of long-standing co-morbidities. On examination, she was afebrile, tachycardic with stable blood pressure and oxygen saturation. Per abdomen examination revealed diffuse tenderness with no organomegaly. Rest of the systemic examination was essentially normal.

A working diagnosis of acute gastroenteritis with ARF was made and admitted in ICU. Investigations revealed thrombocytopenia (Platelet count-23,000 cells/mm³). Prothrombin time (20.2 seconds) and APTT was elevated (66 seconds). Kidney parameters were elevated (Serum creatinine-2.4 mg/dl, BUN-23.5 mg/dL). Serologies for HIV, hepatitis (A, B, C, and E), Leptospira were negative. In view of low platelets and deranged coagulation profile, the patient was tested for dengue serology and was positive (Bio Standard Diagnostics, Gurgaon, India). The patient was diagnosed to have DHF and was transfused with 6 units of random donor platelets, subsequent platelet values was 33,000 mm³.

On day 2, the patient looked icteric and liver function tests revealed AST-7002 UI/l, ALT-1878 UI/l, total bilirubin 2.8 mg/dl, and ALP-357 UI/l. Platelets count further dropped (10,000 cells/mm³) and kidney parameters further worsened (serum creatinine-3.7 mg/dl, BUN 45.6 mg/dl). The patient was transfused with one unit of single donor platelets (SDP), following which the platelet counts improved to 80,000/mm³.

On Subsequent days, renal parameters worsened, with the patient becoming oliguric (urine output <300 ml), creatinine and potassium being 5.3 mg/dl and 6.6 m Eq/l respectively. She was put on haemodialysis. After 3 cycles of dialysis on alternate days, urine output gradually improved with fall in serum creatinine to 1.3mg/dl. Liver function improved over next few days and patient was discharged home on day 16 of admission.

Case 2

A 52-year-old female presented with fever, breathlessness, altered sensorium and yellowish decoloration of the sclera of 7 days duration. There were no signs of meningeal irritation. The patient was a known hypertensive on amlodipine for last 5 years.

On examination, she was febrile (100 F), tachycardic (120/min), blood pressure was 86/60 mmHg with respiratory rate of 32/min. Systemic examination was essentially normal. Blood investigations revealed leukocytosis with thrombocytopenia (TC-14,800/mm³, platelets-22,000/mm³). Blood gas analysis showed metabolic acidosis with compensatory respiratory alkalosis (pH-7.170, bicarbonate-6.6 mEq/L, pCO2-18.6, with base deficit of -19.5 mEq/L). Liver functions test was deranged (Total bilirubin 4.8 mg/dl, AST-4914 UI/L, ALT-878 UI/L, and ALP-338 UI/L). The coagulation functions, renal functions and serum electrolytes and creatinine were within normal limits. Chest X-ray showed bilateral pleural effusion. USG abdomen revealed cholelithiasis, fatty liver and ascitis. Serology for HIV, hepatitis (A, B C E), leptospira, and smear for malarial parasites were negative. Dengue IgG and IgM was positive (Bio Standard Diagnostics, Gurgaon, India).

The patient was diagnosed to have DHF and admitted to ICU. In view of altered sensorium, the patient was electively intubated and mechanically ventilated. One unit of SDP was transfused, and subsequent platelet count was 98,000/mm³. The blood pressure and ABG parameters gradually improved on fluid resuscitation. On day 3, renal parameters gradually worsened. Serum creatinine
was 4.8mg/dl; urine output was less than 200ml. In view of oliguria and raising serum creatinine levels, patient was diagnosed to have ARF and put on haemodialysis. After six cycles of alternate day dialysis, urine output and renal parameters improved. The patient was weaned off from mechanical ventilation and extubated. Liver function tests gradually returned to baseline values by 13th day of admission to ICU. The patient was discharged home one week later with normal liver and renal function tests.

DISCUSSION: Involvement of liver is common in DHF manifesting with hepatomegaly and elevated liver enzymes.[8] ARF in dengue is a rare and poorly understood manifestation of the syndrome. Although there are no large scale studies on ARF in dengue, several small series and case-reports exist worldwide.[2-7] The etiology of renal damage in dengue is multifactorial.[9] The mortality associated with ARF in dengue is very high. In a retrospective study, ARF was found in 10 (3.3%) among 304 hospitalized adults with DHF (DHF), and 6 (60%) of the 10 patients with ARF died.[9] The high mortality rate in this study was attributed to unawareness of this potentially fatal complication among the clinicians treating these patients.

It is an well established fact that the risk of renal failure increases in the presence of established chronic kidney disease, and in the presence of other comorbidities such as diabetes, arteriosclerosis, hypertension, and cardiovascular disease (10). Ali and colleagues found that patients with acute-on-chronic kidney disease were significantly older than patients with acute kidney failure alone, and that their chances of renal recovery were reduced(11). However our second patient had normal serum electrolyte and creatinine levels on admission.

Management of ARF in Dengue is more complicated than in an ARF of any other etiology owing to associated coagulopathy, hyperkalemia, severe metabolic acidosis and pulmonary edema. There are no specific guidelines for the management of ARF in dengue. An intensive monitoring of fluid and electrolyte balance and timely hemodialysis becomes part of the complicated management of this syndrome.

In the present study, we report two cases of DHF who went into ARF and owing to ICU management and hemodialysis, both cases recovered completely. This comprehensive recuperation prompted us to notify the scientific world about the good prognosis of this potentially lethal complication and the importance of early initiation of treatment.

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