Necrotizing Enterocolitis with Circulatory Failure in an Adolescent with Dengue Hemorrhagic Fever: A Case Report

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Abstract

Necrotizing enterocolitis (NEC) usually occurs in adult patients with haematological malignancy and after chemotherapy. The mortality rate can be high with 50% of patients died of necrotic bowel, perforation and sepsis.

We reported a 15 years old Malay male with no known medical illness presented with history of high grade fever, headache, severe myalgia, abdominal discomfort, nausea but no bleeding symptoms 4 days prior to admission. He was fully conscious without any circulatory failure or clinical evidence of plasma leakage. He had a platelet count of 96,000/mm³ and a positive dengue serology for IgM during admission. He was treated as dengue fever with fluids and close observation. Within two days of admission, patient complained of severe abdominal discomfort and passing out frequent loose stools. The abdomen was grossly distended with tenderness over his epigastric region. He rapidly progressed into dengue hemorrhagic fever and circulatory failure. The only two supine abdominal x-rays revealed dilated and thickened small bowels with pneumatosis intestinalis, a pathognomonic feature of NEC.

Introduction

This case report illustrates an unusual presentation of dengue hemorrhagic fever in an adolescent with rapid progression into necrotizing enterocolitis (NEC) and circulatory failure. A common disease in tropics, dengue hemorrhagic fever carries a fatal mortality if progresses into hemodynamic failure. While acute colitis was reported in adult dengue hemorrhagic fever, necrotizing enterocolitis has not been reported in the literature.

Case Report

We report a 15 years old child of Malay origin, a male with no known medical illnesses presented with a history of high grade fever, headache, severe myalgia, abdominal discomfort, nausea but no bleeding symptoms four days prior to admission. Physical examination was otherwise normal with a soft abdomen and no hepatosplenicomegaly. He had a platelet count of 96,000/mm³ and a positive dengue serology for IgM during admission. He was treated as dengue fever with fluids and close observation. Patient complained of abdominal discomfort with passing out frequent loose stools after 48 hours of admission. The abdomen was grossly distended with tenderness over his epigastric region and tympany on percussion. Bowel sounds were sluggish and absent over his left hypochondriac region. The platelet count was dropping to 70,000/mm³ and his potassium level was 2.8mmol/l. He rapidly progressed into dengue hemorrhagic fever with pleural effusion and hypoxia as a result of plasma leakage.

His blood pressure remained relatively stable initially supported by fluids and inotropic agents. He was then electively ventilated and managed in intensive care unit (ICU). The patient eventually succumbed to septicemic shock and death within 24 hours. Surgical management was considered earlier but the poor hemodynamic condition which did not improved was deemed unstable for surgery. Autopsy was not carried out due to request from parents and religious reasons. The only two supine abdominal x-rays were performed within 24 hours of deterioration (Figure 1 and 2). The first x-ray revealed multiple dilated and thickened small bowels with two of the thickened segments showing pneumatosis intestinalis without any changes in position suggesting aperistaltic bowels. There was no portal venous gas or air under diaphragm seen. The second x-ray showed a similar picture with even more dilated small bowels at high risk of perforation.

Discussion

Common gastrointestinal complications described in adults with Dengue fever include gastrointestinal bleeding and liver function abnormalities. This is our first experience with NEC in dengue hemorrhagic fever. The diagnosis was established after review of abdominal x-rays.
The rapid progression into multi-organ failure in this patient prevented the use of other more useful imaging modalities including CT scan or ultrasonography to exclude NEC. However plain abdominal x-ray remained the standard imaging modality for the diagnosis of NEC. The features of NEC on plain abdominal x-ray included bowel dilatation due to ileus, intramural gas (pneumatosis intestinalis), free intraperitoneal gases due to bowel perforation and fluid-filled dilated thickened caecum. Portal venous gas is a severe feature of NEC on plain x-ray and it is due to the extension of intramural gas into the veins of bowel wall. However this feature is not present in this patient.

The pathogenesis of NEC is incompletely understood. Combination of factors probably caused mucosal damage and led to intestinal ischemia. The mucosal damage may be due to infection, intraluminal contents, immature immunity, release of inflammatory mediators and vasoconstrictors. We believe that dengue hemorrhagic fever may have been associated with extensive microvascular damage in the intestinal wall which leads to rapid intestinal ischemia.

References

Illustrations

Illustration 1

Figure 1: A supine abdominal x-ray performed during admission into intensive care unit showing dilated and thickened small bowels. The arrow shows the segment of small intestine with pneumatosis intestinalis, irregular thickened bowel wall, thumbprinting sign and aperistalsis.
Illustration 2

Figure 2: A supine abdominal x-ray repeated within 24 hours on admission to intensive care unit. The small intestines remained thickened and even more dilated with high risk of perforation. The arrow still shows the aperistalsis bowels with pneumatosis intestinalis.
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