

Case Report

Severe dengue with acute abdomen- a diagnosis dilemma

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Abstract

Dengue is an emerging mosquito-borne viral infection transmitted between humans by *Aedes spp.* The rapid growth of dengue cases globally created a public health challenge in managing it. Since the dengue is a viral disease, a patient usually presented with non-specific clinical features with no definite drug or vaccine proven to treat it. Hence, a simple diagnostic tool for the early phase of the illness, early supportive treatment and efficient vector control measures are the essential elements in a holistic approach to managing a dengue infection. However, with a non-specific presentation of the disease and high variability of rapid diagnostic test sensitivity and specificity, the diagnosis is more challenging. The failure of detecting dengue infection, especially the severe variety may lead to a grave consequence. This case illustrates how a non-specific presentation with false negative diagnostic test result leads to unnecessary surgical intervention in a severe dengue patient.

Keywords: acute abdominal pain; dengue serology; severe dengue;

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Background

In the past decade, the impact of dengue as a burden to healthcare services and finances has increased substantially [1]. Globally, it is estimated that 50 to 100 million dengue cases were reported per year across approximately half of the world's population, especially in hyper endemic regions in Southeast Asia and the Pacific [1,2].

Dengue infection is caused by dengue virus of *Flavi virus* genus which is serologically distinct named DEN-1, DEN-2, DEN-3 and DEN-4. Each dengue viral infection with one serotype gives long-lasting immunity to the same serotype [2]. The risk of developing severe dengue manifestation is significantly higher in secondary infection of different dengue serotypes [4]. It may be asymptomatic or may present as Dengue fever (DF) and Severe Dengue fever which include Dengue haemorrhagic fever (DHF) and Dengue shock syndrome (DSS). The typical symptoms of dengue infection are fever, malaise, headache, musculoskeletal pain, abdominal pain, nausea and vomiting [3]. Presentation of dengue may vary from mild to severe, including tissue hypo-perfusion which can be life-threatening.

At present, laboratory confirmation of dengue depend on demonstration of the presence of DENV by (a) isolation of DENV from patient serum, (b) detection of viral RNA by reverse transcription– polymerase chain reaction (RT-PCR), and (c) detection of dengue-specific antibodies (immunoglobulin M (IgM)/ G (IgG)) by using enzyme-linked immunosorbent assay (ELISA) [4]. Each method has its advantages and disadvantages that define criteria for their selection in different settings. No single diagnostic assay can accurately detect dengue throughout the acute and convalescence phases.

Case Report

A 43-years old lady presented to a secondary healthcare facility complaining of acute severe generalised abdominal pain for one day duration. It was preceded by a history of reduced oral intake, high-grade fever and frequent vomiting for three- days before admission. Upon presentation, she appeared lethargic with moderate to severe dehydration. The vitals were in the normal range except for the tachycardia and no documented fever. Examination of the abdomen revealed a generalised tenderness with guarding. There were no other warning symptoms or signs of dengue elicited such as bleeding tendencies or hepatomegaly. The bedside ultrasound assessment revealed a collection of free fluid at the Morrison pouch. Initial blood investigations showed thrombocytopenia with haemoconcentration, increased liver transaminases and deranged coagulation profile. Other relevant investigations such as electrocardiogram, cardiac enzyme and serum amylase were normal.

As such the patient was transferred to a tertiary hospital with the diagnosis of acute abdomen. However in the tertiary healthcare centre, looking at the clinical features and blood results, a dengue infection was considered as differential diagnosis. Hence a dengue serology immunoglobulin G (IgG)/ immunoglobulin M (IgM) detection assays were done. However the result comes out as negative. She was referred to the surgical unit for

acute abdomen with the possibility of the perforated viscus. Throughout the admission, she had persistent abdominal pain and on day 7th of illness, diagnostic abdominal laparoscopy was performed. The intraoperative findings include the presence of hemoperitoneum extending up to sub hepatic region, normal bowel and uterus with an appearance of petechiae rash at the peritoneum and mesentery.

Subsequently a dengue serology NS1 was performed, and the result was positive for dengue infection. The patient was treated as a case of severe dengue in intensive care unit. She showed progressive improvement of the clinical condition and was able to be discharged on day 12th of hospitalisation. At that point in time, the clinical and blood parameters were back to normal range.

Discussion

Dengue manifestation ranges from mild disease with nonspecific symptoms resembling mild pharyngitis to the most severe form of illness leading to tissue hypoperfusion which may result in death [5,6]. It may be challenging to differentiate a dengue infection from other viral diseases. Occasionally, dengue infection may mimic acute abdomen which subsequently will lead to unnecessary surgical intervention. This case illustrates the diagnostic challenge whereby the non- specific constellation of symptoms and signs led to the diagnosis of acute abdomen which required surgical intervention. Although initially the treating team did consider dengue as a differential diagnosis but due to a negative initial serology test result, the diagnosis was ruled out.

Acute abdominal pain or 'acute abdomen' is being used interchangeably. It is defined as acute abdominal pain of non-traumatic origin with a maximum duration of 5 days [6]. Abdominal pain in dengue patient may mimic surgical emergencies which require urgent surgical intervention. The causes of abdominal pain in dengue patient include acalculous cholecystitis, pancreatitis, appendicitis, hepatitis and it may be a non-specific pain. The most common acute surgical complication in dengue patient is acalculous cholecystitis followed by pancreatitis [6]. However, these patients usually respond to symptomatic treatment and intravenous fluids. Timely surgical intervention might be needed in these patients when the benefits outweigh the risks. Diagnosis of the acute abdomen can be made with the help of imaging modalities such as abdominal ultrasound or computed tomography [7]. The exact pathogenesis of acute surgical complication in dengue patient is still unclear. However, few postulations were put forward. One of the widely accepted postulations is that the virus invades intra-abdominal organ wall which then causes tissue oedema [8]. In dengue fever, the effusions are mostly serous or serosanguinous, and rarely blood [9]. Intraoperative findings of this case include evidence of hemoperitoneum and petechial haemorrhage of the peritoneum and mesentery which is said to be a rare occurrence. Based on previous report, dengue patients with an acute abdomen that underwent surgical intervention had prolonged hospital stay compared to patients who were treated conservatively [10]. Analysis of resected appendix from dengue patient who underwent appendectomy showed no significant inflammation macroscopically. However microscopic finding showed

lymphoid follicular hyperplasia which is similar to lymphadenopathy in other organs. It is recommended to approach dengue patient with symptoms of acute abdomen carefully. It is challenging to clinically differentiate dengue from acute bacterial appendicitis¹¹.

The performance of all diagnostic methods varies depending on the duration of the clinical disease. Thus, it is imperative to determine the performance of individual tools within the course of illness, as the right tools should be used at the right time to ensure excellent diagnostic capability. A recent study showed that NS1 detection was the most sensitive test in the primary healthcare setting. It also showed that the sensitivity of RT-PCR tend to decline after three days of the onset of fever, indicating that PCR technology would be appropriate for dengue diagnosis only during the very early stages of the disease. Moreover, dengue IgM=IgG detection assays also showed low sensitivity (<32.0%) for sera collected during the first five days of fever. However, NS1 antigen detection assays demonstrated a consistently high sensitivity of DENV detection among sera obtained within the first six days of fever. Based on these observations, dengue NS1 antigen assays appeared to be an alternative to RT-PCR and antibody testing in the routine diagnosis of dengue. Medical practitioners are encouraged to request assays for dengue NS1 for patients within five days of fever onset and IgM assays for those beyond the fifth day after the onset of fever. This strategy would achieve an improved sensitivity of 87.2% in detection of dengue infection (sensitivity of dengue NS1 assay: 86.5%; the sensitivity of IgM: 90.0%)^[12].

Conclusion:

Dengue infection may mimic acute abdomen that requires urgent surgical intervention. A high index of suspicious and proper selection of the diagnostic tool is crucial in detecting it. Early and proper selection of the serology testing does help in diagnosing and differentiating a dengue infection from a true acute abdomen that requires urgent surgical intervention. These tests would avoid inappropriate intervention that may cause unnecessary burden to patient and ultimately will improve the morbidity and mortality in dengue infection.

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