Original Article

Acute acalculous cholecystitis in dengue fever

Shaheen Bhatty, Niaz Ahmed Shaikh, Mariam Fatima, Aneel Kumar Sumbhuani
Medical Unit 1, Civil Hospital Karachi, Dow University of Health Sciences, Karachi.

Abstract

Objective: To investigate the frequency, clinical features, management and outcome of acute acalculous cholecystitis in dengue fever patients.

Methods: Forty patients were admitted with the diagnosis of dengue fever, according to the clinical manifestations and laboratory investigations. The diagnosis of dengue fever was confirmed by a positive IgM antibody test result for a late or convalescent phase blood specimen.

The diagnosis of acute acalculous cholecystitis was made according to clinical features and sonographic findings. Liver function tests, complete blood counts were determined. Abdominal ultrasound was performed with a real time scanner in patients with abdominal pain and abnormal results on liver function tests.

Results: Eleven out of 40 patients of dengue fever (27.5%) had complication of acute acalculous cholecystitis. There were 8 males and 3 females. The mean and standard deviation from the onset of fever to hospital visit was 3.3 ± 0.8 days (range 2-5 days). The mean white cell counts was 4154 ± 1577.5 cmm. The mean platelet counts were 26,727 ± 10460.3 cmm on presentation in hospital. The mean SGPT level was 148.5 ±190.17 mg/dl. Mean alkaline phosphatase was 398 ± 214.8 mg/dl. On sonography all had thickened gall bladder. The mean gall bladder wall thickness was 5.2 ± 1.3 mm. Three patients had ascites and one patient had pleural effusion.

Conclusion: Acute acalculous cholecystitis was seen in a significant proportion of patients with dengue fever. All patients improved with good hydration and correction of thrombocytopenia. Based on these observations it is suggested that close observation and initial treatment of thrombocytopenia is mandatory (JPMA 59:519; 2009).

Introduction

Dengue fever (DF) is a mosquito-transmitted disease caused by the dengue virus, an enveloped, single stranded RNA virus of flaviridae.[1] Dengue is widely distributed in many countries in southeast and southern Asia, Central and South America, and the Western Pacific regions.[2] The incidence of dengue fever and dengue haemorrhagic fever (DHF) has increased thirty folds globally in the last four decades and more than half the worlds population (including developed countries) is now threatened with infection from dengue virus.[3] Dengue virus infection manifests with wide range of severity from asymptomatic mild febrile illness to life threatening disease including dengue haemorrhagic fever and dengue shock syndrome (DSS). Classic dengue fever frequently presents with fever, headache, muscle, bone or joint pains, nausea, vomiting and skin rash.

DHF and DSS are characterized by 4 major manifestations: high grade fever, haemorrhagic

phenonmena, often hepatomegaly and circulatory failure.[1]

Some unusual clinical manifestations have been reported, including fulminant hepatitis, encephalopathy, cardiomyopathy, acute pancreatitis and acalculous cholecystits.[4] Reports of dengue fever complicated by acute acalculous cholecystits are rare.[5-7] The etiology of acalculous cholecystitis is usually well described in association with burns, trauma, vasculitis, past surgical conditions and certain infections such as salmonellosis[8] or cytomegalovirus in immunocompromised patients.[9]

In 2006 from June to November, 4318 patients suspected of viral haemorrhagic fever or dengue fever were admitted in different hospitals in Karachi. Of these 1458 patients were positive for dengue fever serology and 45 patients died due to the disease.

The objective of this study was to assess the incidence, treatment and prognosis of acute acalculous cholecystitis in dengue fever patients.

Patients and Methods

During the period of two months from September 2006 to October 2006, 40 patients were diagnosed to have Dengue fever on clinical presentation and a positive IgM antibody test result for a late or convalescent phase blood specimen. The diagnosis of acute acalculous cholecystits was made according to the clinical features and sonograpic findings. Thickened Gall bladder wall of > 3.5 mm, positive sonographic Murphy's sign which is the maximum tenderness of sonographically localized Gall bladder were considered consistent with acute acalculous cholecystits.[10,11] Symptoms of dengue fever like fever, rash, myalgia, headache, retro-orbital pain, abdominal pain, vomiting, chills and diarrhea were recorded.

Investigations included complete blood counts and liver function tests. Abdominal ultrasound was performed with a real time only in patients with abdominal pain and abnormal results on liver function tests.

Data was analyzed on SPSS version 15 and mean and standard deviation were estimated.

Results

Eleven out of 40 patients (28%) with dengue fever had the complication of acute acalculous cholecystitis. Of these, 8 were males and 4 were females. The clinical symptoms and signs of dengue fever are shown in Table.

The mean white blood cell count was 4154 ± 1577.5 mm^3. The mean platelet count was 26,727 ± 10460.3 mm^3. The mean SGPT level was 148.5 ± 190.17 IU/L and the mean alkaline phosphatase level was 398 ± 214.81 IU/L. Sonographic findings of 11 dengue fever patients with acute acalculous cholecystitis are shown in Table.

Table: Symptoms, Signs & Ultrasound findings of 11 dengue fever patients with acute acalculous cholecystitis.

Symptoms	No of cases	%
Fever	11	100%
Vomiting	11	100%
Upper abdominal pain	11	100%
Bodyaches	8	72%
Rash	8	72%
Headache	4	36%
Retro orbital pain	1	9%
Clinical signs	**No of cases**	**%**
Epigastric tenderness	11	100%
Sub conjunctival hemorrhage	10	90%
Macular rash	8	72%
Congested throat	5	45%
Jaundice	3	27%
Findings	**No. of patients**	
Thickened Gall Bladder	11	
Pericholecystic fluid	11	
Ascites	3	
Pleural effusion	1	

All of the 11 patients were treated conservatively with good hydration and antipyretics. The mean duration of hospital stay was 4.73 ± 0.905 days. Five of the 11 patients were given platelet concentrate transfusion and none required any surgical intervention.

Discussion

Classically Dengue fever presents as fever with myalgia.[12] Many unusual presentations of dengue virus infection have been reported, including acute renal failure, haemolytic-uremic syndrome, disseminated intravascular coagulation, haemorrhagic syndrome, acute peritonitis, pulmonary haemorrhage, acute respiratory distress syndrome, spleen rupture, acalculous cholecystitis, arrythmias and myocardial dysfunction.[1,13]

Abdominal pain is a commonly reported symptom in dengue fever. The reported causes of abdominal pain in dengue fever include hepatitis, pancreatitis, acalculous cholecystitis and peptic ulcer disease.[14] The clinically overlapping manifestations of dengue virus and bacterial infections make it difficult, if not impossible, to distinguish these infection entities from each other.[15] In our study 11 out of 40 patients of dengue fever had acute acalculous cholecystitis ie 28% as compared with Keng-liana wu et al. who found dengue fever with acute acalculous cholecystitis in 7.6% (10 of 131 patients).[11] In another study done by S Khanna et al, the incidence was 16.36% in dengue patients (9 out of 55 patients).[14]

The exact pathogenesis of acute acalculous

cholecystitis is obscure but cholestasis and increased bile viscosity from prolonged fasting, spasm of the ampula of vater, infection, endotoxaemia, microangiopathy and ischaemia-reperfusion injury, among other causes have been suggested.[8] The pathophysiology in the development of acute acalculous cholecystitis from infection with dengue virus is unknown. It may be due to virus invasion of the gall bladder wall causing oedematous change.[9] The main pathophysiologic change in dengue fever could be increased vascular permeability causing plasma leakage and serous effusion with high protein content, which then induces thickening of gall baldder wall.

Laboratory findings commonly associated with dengue fever include neutropenia, lymphocytosis, increased concentration of liver enzymes and thrombocytopenia.[16]

Study done by Keng-Liang wu et al,[17] showed that sonographic features of dengue fever include thickened gall bladder wall, ascites, splenomegaly and pleural effusion which was either right sided or bilateral. In our patients there was thickened gall bladder wall with peri-choelcystic fluid in all patients , three had ascites and one patient had minimum right sided pleural effusion.

Acute acalculous cholecystits is associated with burns, trauma, vasculitis, post surgical conditions and certain infections such as salmonellosis. The mortality rate of acute cholecystits is very high ranging from 10% to 50%. The rapid progression of acute cholecystits to gangrene and perforation has been reported. Therefore prompt early recognition and intervention is required.[18] However in dengue fever with acute cholecystitis the course of cholecystitis is self-remitting and thickening of gall bladder wall could return to normal after some days. Thus cholecystectomy would not be indicated for these patients, more over the resulting bleeding would be very difficult to manage during and after surgery.

In our study the mean duration of hospital stay was 4.73 ± 0.905 days as compared to 3.75 ± 0.5 days in patients without acalculous cholecystitis. All the 11 patients were treated conservatively with good hydration and antipyretics. Five of the 11 patients required platelet transfusion and none of them required any surgical intervention. Based on these results, close observation might be adequate for dengue fever patients with acute acalculous cholecystits and invasive treatment may not be initially required. Surgical treatment could be only indicated for dengue fever complicated by diffuse peritonitis.

The prognosis of dengue fever patients with acute cholecystits is better than in patients having other causes of gall bladder disease.

Conclusion

Acute acalculous cholecystits occurred in a significant proportion of patients with dengue fever and this complication should be considered in endemic areas. All patients improved with good hydration and correction of thrombocytopenia.

References

1. Chen TC, Perng DS, Tsai JJ, Lu PL, Chen TP. Dengue hemorrhagic fever complicated wit acute pancreatitis and seizure. J Formos Med Assos 2004; 103:865-8.
2. Khor BS, Liu JW, Lee IK, Yang KD. Dengue hemorrhagic fever patients with acute abdomen: clinical experience of 14 cases. Am J Trop Med Hyg 2006; 74: 901-4.
3. Bennett SN, Holmes EC, Chirivella M, Rodriguez DM ,Beltran M, Vorndam V, et al. Selection-driven evolution of emergent dengue virus. Mol boil Evol 2003; 20: 1650-8.
4. Van Troys H, Gras C, Coton T, Deparis X, Tolou H, Durand JP. Imported dengue hemorrhagic fever: a props of 1 case presenting with signs of acute alithiasis cholecystitis. Med Trop (Mars) 2000; 60:278-80.
5. Sood A, Midha V, Sood N, KaushalV. Acalculous cholecystitis as an atypical presentation of dangue fever. Am J Gastroenterol 2000; 95: 3316-7.
6. Sharma N, Mahi S, Bhalla A, Singh V, Varma S, Ratho RK. Dengue fever related acalculous cholecystitis in a North Indian tertiary care hospital. J Gastroenterol Hepatol 2006; 21: 664-7.
7. Tan YM, Ong CC, Chung AY. Dengue shock syndrome presenting as acute cholecystitis. Dig Dis Sci 2005; 50: 874-5.
8. Winkler AP, Gleich S. Acute acalculous cholecystitis caused by salmonella typhi in an 11-year-old. Pediatr Infect Dis J 1998; 7: 125-8.
9. Cappell MS. Hepatobiliary manifestations of the acquirted immune deficiency syndrome. Am J Gastroenterol 1991; 86: 1-15.
10. Engel JM, Deitch EA, Sikkema W. Gallbladder wallthickness: sonographhic accuracy and relation to disease. Am J Roentgenol 1980; 134: 907-9.
11. Wu KL, Changchien CS, Kuo CM, Chuah SK, Lu SN, Eng HL, Kuo CH, et al. Dangue fever with acute acalculous cholecystitis. Am J Prop Med Hyg 2003; 68: 657-60.
12. Joshipura VP, Soni HN, Patel NR, Haribalkhti SP .Dengue fever presenting as acute acalculous cholecystitis. J Indian Med Assoc 2007; 105: 338-9.
13. Ahluwalia G, Sharma SK. Dengue: Current Trends And Challenges -- An Indian Perspective. JAPI 2004; 52: 561-3.
14. Khanna S, Vij JC, Kumar A, Singal D, Tandon R. Dengue fever is a differential diagnosis in patients with fever and abdominal pain in an endemic area. Ann Trop Med Parasitol 2004; 98: 757-60.
15. Lee IK, Liu JW, Yang KD. Clinical characteristics and risk factors for concurrent bacteremia in adults with dengue hemorrhagic fever. Am J Trop Med Hyg 2005; 72: 221-6.
16. Kuo CH, Tai DI, Chang-Chien CS, Lan CK, Chiou SS, Liaw YF. Liver biochemical tests in dangue fever. Am J prop Med Hyg 1992; 47: 265-70.
17. Wu KL, Chungchien CS, Kuo CH, Chiu KW, Lu SN, Ku CM, et al. Early abdominal sonographic finding in patients wit dengue fever. J Clin Ultrasound 2004; 32: 386-8.
18. Boland GW, Lee MJ, Leung J, Mueller PR. Percutaneous cholecystectomy in critically ill patients: early response and final outcome in 82 patients. Am J Roentgenol 1994; 163; 339-42.