International Journal of Advances in Medicine
Prashanth VN et al. Int J Adv Med. 2019 Oct;6(5):1476-1481
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: http://dx.doi.org/10.18203/2349-3933.ijam20194135

Original Research Article

Study of gastrointestinal manifestations in Dengue fever

Prashanth V. N., Manasa G.*

Department of General Medicine, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India

Received: 19 July 2019
Revised: 08 August 2019
Accepted: 13 August 2019

***Correspondence:**
Dr. Manasa G.,
E-mail: manasag215830@gmail.com

ABSTRACT

Background: Dengue is an arthropod borne viral haemorrhagic fever. In India between 2015-2017, 790 deaths have been recorded according to NVBDCP data. Gastrointestinal manifestations are among the most common manifestations in dengue fever, and are most often missed due to lack of awareness. This study aims to find the spectrum of Gastrointestinal manifestations and correlation of GI manifestations with severity of Dengue.
Methods: A cross-sectional observational study was conducted on 100 consecutive cases of serologically confirmed Dengue fever. Patients were examined clinically, and laboratory data was assessed till they got discharged. Gastrointestinal manifestations of dengue fever were noted and analyzed.
Results: This study included 100 consecutive cases of dengue fever. Mean age of the study population was 32.48+12.40 years of them 77 were males and 23 were female patients. Gastrointestinal manifestations were noted in 96% of the patients. GI manifestations noted were Nausea in 71%, Elevation of transaminases in 59%, vomiting in 54%, pain abdomen in 31%, Ascites in 24% hepatomegaly in 14%, diarrhoea in 13%, Acalculous cholecystitis in 13%, Acute fulminant hepatitis in 6%, Upper GI bleed in 6%, splenomegaly in 5%, and Acute pancreatitis in 4% of patients. Of these, GI manifestations like nausea, vomiting, pain abdomen, GI bleed, ascites, jaundice, elevation of transaminases, acute fulminant hepatitis and acute pancreatitis correlated with severity of Dengue fever .
Conclusion: Gastrointestinal manifestations in Dengue fever are much more common than once thought of. In our study it was found in 96 percent of patients making it most common manifestations in dengue fever. Transaminitis and Atypical GI manifestations like acute pancreatitis, acute fulminant hepatitis may indicate severe Dengue. The differential diagnosis of an acute febrile syndrome with abdominal pain or gastrointestinal symptoms in patients living in endemic areas should include Dengue fever.

Keywords: Abdominal pain, Acute fulminant hepatitis, Acute pancreatitis, Dengue fever, Gastrointestinal manifestations, Transaminases

INTRODUCTION

Dengue fever is a widespread arthropod borne viral infection transmitted by Aedes aegypti mosquito. It is caused by Dengue virus (DENV) which belongs to genus flavivirus of Flaviviridae family. Dengue fever may manifest as a wide spectrum of disease, from a mild febrile illness known as Dengue fever through to 'severe dengue' which is characterized by capillary leakage, organ involvement and bleeding complications.[1] The disease has a seasonal pattern, with a peak incidence during July - November, mostly after monsoon.[2]

The disease is endemic in tropical and sub-tropical regions, most prevalent in Southeast Asia, the America, and Western Pacific regions.[2] Based on trends in endemicity, India is identified as a Category B country as the country is reported to experience cyclic epidemics.[2]

Aetiological diagnosis can be confirmed by serological testing and virus detection by isolation or molecular technique from the blood during the early febrile phase. Serological testing includes detection of NS1, IgM or IgG ELISA.[2]

Over the last few decades, with growing population, rapid urbanization and inappropriate sanitary measures, the epidemics and subsequent dengue infections have increased rampantly. With rising disease burden, atypical manifestations have increased as well, which are most often missed due to lack of awareness.

Atypical gastrointestinal manifestations of dengue reported are hepatitis, fulminant hepatic failure, acalculous cholecystitis, acute pancreatitis, and diarrhoea. Upper GI bleed, ascites can occur as a consequence of plasma leakage in severe dengue. Hepatomegaly and few cases of splenomegaly have been reported in dengue infection.[3]

Hepatic dysfunction is a crucial feature seen in DENV infection. Hepatocytes and Kupffer cells are prime targets for DENV infection, as confirmed in biopsies and autopsies of fatal cases. For infecting cells, the major rate limiting step is the viral attachment to the receptors present on surface of host cell. An eventual outcome of hepatocyte infection by DENV is cellular apoptosis, a phenomenon demonstrated both *in vivo* and *in vitro.*[4]

The exact pathogenesis of pancreatic involvement in dengue is not known. But it can be due to result of direct invasion by the virus itself causing inflammation and destruction of pancreatic acinar cells; pancreatic damage due to dengue shock syndrome; or acute viral infection causing an autoimmune response to pancreatic islet cells and development of edema of the ampulla of Vater with obstruction to the outflow of pancreatic fluid.[5]

This study aims to study the spectrum gastrointestinal symptoms, signs and laboratory parameters in patients with dengue fever in our set-up.

Objectives

- To study the spectrum of gastrointestinal manifestations in Dengue fever.
- To study the correlation of GI manifestations with severity of Dengue fever.

METHODS

Source of data

The study was conducted on 100 consecutive patients presenting to hospitals attached to Bangalore Medical College & Research Institute, who have been diagnosed to have Dengue fever satisfying inclusion and exclusion criteria were taken for study. The study was approved by the hospital ethical committee.

Methods of collection of data

The design was Cross sectional Observational study conducted on August 2018-March 2019. Contain 100 sample size with Consecutive samples. Collaborating Hospitals attached to Bangalore Medical College & Research Institute, Bangalore.

Inclusion criteria

- Patients willing to give written informed consent
- Age ≥18 years
- Patients with dengue fever (NS1 or IgM positive cases)

Exclusion criteria

- Established chronic liver disease, pancreatitis.
- Patients with Malaria and Enteric fever and other causes of fever.

Among patients who were admitted to hospitals affiliated to Bangalore Medical College and Research Institute, 100cases of dengue fever were included in the study.

Information was collected and detailed history was taken using pre-formed proforma at the time of admission. Steps were taken to send for relevant investigations and detailed clinical examination of the patient was done.

Statistical analysis

Descriptive statistics was used for analysis. The quantitative variable were expressed as mean and standard deviation. P value <0.05 was considered significant). Sensitivity and specificity analysis was carried out to find correlation of GI manifestations with severity of Dengue fever.

RESULTS

The sample size in our study was 100 patients. The age distribution was between 18 to 70yrs with mean age of patients being 32.98±12.4 yrs (Table 1). 77 were male and 23 were female (Fig 1).56 percent of patients were from urban areas and 44 percent of them were from rural population (Figure 2).

Among 100 patients, 21 patients diagnosed as severe Dengue according to WHO classification (Figure 3).

Table 2 outlines the various GI manifestations in dengue fever in the study population. Gastrointestinal manifestations were noted in 96 percent of the patients. Most common GI symptom noted was nausea seen in 71% of the patients, vomiting in 59% followed by pain abdomen in 33 % and diarrhea occurred in 13% patients. Transaminitis was present in 59% of patients, 6 of them had acute fulminant hepatitis. Ascites was present in 24%, acalculous cholecystitis in 13%, GI bleed in 6%,

hepatomegaly and splenomegaly were found in 14 and 6 percent of patients respectively. Acute pancreatitis was found in 4% of patients. In our study Atypical manifestations such as acalculous cholecystitis, acute fulminant hepatitis, acute pancreatitis were noted in significant number of patients.

Table 1: Age distribution and routine investigations.

Parameters	Mean	Standard Deviation
Age	32.98	12.40
HB	13.12	2.22
TLC	4612.73(4350)	3702.38(15.75,6875)
PLT	53966.03(40000)	44756.83(19000,88000)
TB	1.54(1)	2.06(0.6,0.15)
DB	0.66(0.3)	1.15(0.2,0.7)
Albumin	3.47	0.73
AST	199.86(126.50)	239.5(40.50,242)
ALT	158.66(77.50)	193.8(36,199.25)
ALP	109.01(89.50)	99.71(56,105.75)
S.Amylase	74.87(54)	73.59(34,88.75)
S.Lipase	48.18(33.50)	55.94(20,56.75)

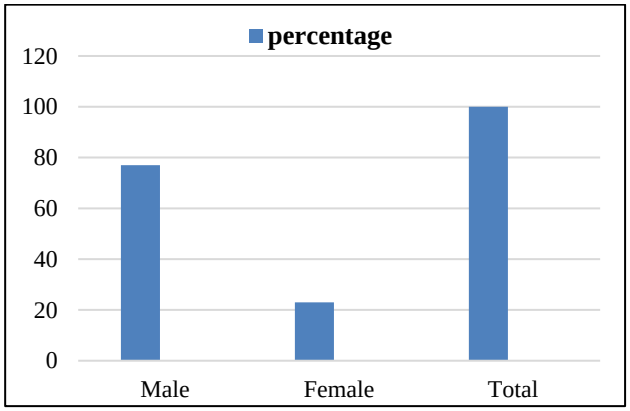

Figure 1: Gender distribution of study population.

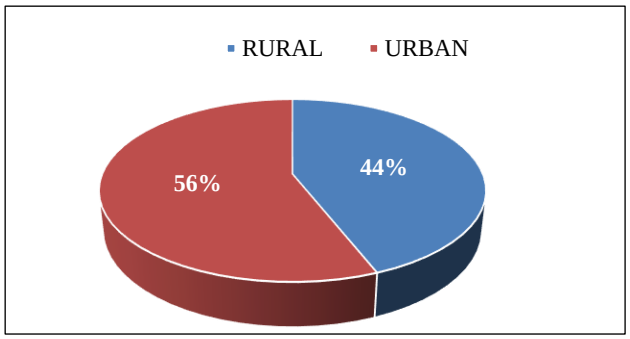

Figure 2: Regional distribution of study participants.

Table 2 outlines the various GI manifestations in dengue fever in the study population. Gastrointestinal manifestations were noted in 96 percent of the patients. Most common GI symptom noted was nausea seen in 71% of the patients, vomiting in 59% followed by pain abdomen in 33 % and diarrhea occurred in 13% patients. Transaminitis was present in 59% of patients, 6 of them had acute fulminant hepatitis.

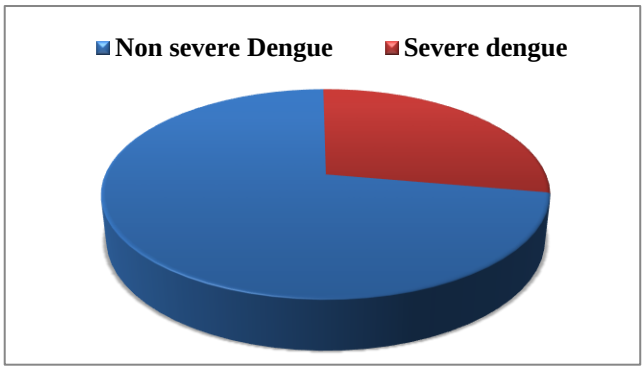

Figure 3: Patients classified according to Severity.

Table 2. Distribution of various GI manifestations in Dengue fever.

Parameter	Percentage
Nausea	71
Transaminitis	59
Vomiting	54
Pain abdomen	31
Ascites	24
Jaundice	18
Hepatomegaly	14
Diarrhoea	13
Acalculous cholecystitis	13
GI Bleed	6
Splenomegaly	6
Fulminant hepatitis	6
Acute pancreatitis	4

Ascites was present in 24%, acalculous cholecystitis in 13%, GI bleed in 6%, hepatomegaly and splenomegaly were found in 14 and 6 percent of patients respectively. Acute pancreatitis was found in 4% of patients. In our study Atypical manifestations such as acalculous cholecystitis, acute fulminant hepatitis, acute pancreatitis were noted in significant number of patients.

Table 3 represents manifestations in Dengue other than GI symptoms and signs. Fever was the most common manifestation noted (99%) followed by myalgia (86%). Few other manifestations were headache, retroorbital pain, polyaralgia and rash.

In this study bleeding manifestations were seen in 34% of population. Acute kidney injury was noted in 22 percent of patients; however, it was mild and none of them required Renal replacement therapy. 3 patients had encephalopathy and 4 patients had acute respiratory distress syndrome (Table 3).

Table 3: Other clinical manifestations in Dengue.

Symptom	Percentage
Fever	99
Myalgia	86
Headache	72
Retroorbital pain	56
Polyarthralgia	44
Exanthematous rash	38
Bleeding manifestations	34
Acute kidney injury	22
Acute respiratory distress	4
Dengue encephalopathy	3

Table 4: GI manifestations with severity of dengue.

GI manifestation	No. of patients n= 100	Severe dengue (n)	Non severe dengue (n)	P value
Nausea	71	20	51	0.001
Transaminitis	59	20	39	0.000
Vomiting	54	13	31	0.048
Pain abdomen	31	11	20	0.026
Ascites	24	9	15	0.023
Jaundice	18	9	9	0.01
Hepatomegaly	14	6	8	0.078
Diarrhoea	13	4	9	0.5
Acalculous cholecystitis	13	5	8	0.185
GI Bleed	6	4	2	0.005
Splenomegaly	6	2	4	0.541
Fulminant hepatitis	6	6	0	0.000
Acute pancreatitis	4	4	0	0.000

Table 4 outlines the correlation of various GI manifestations with the severity of dengue fever.

p value of 0.05 was considered significant. GI manifestations like nausea, vomiting, pain abdomen, jaundice, GI bleed, ascites, elevation of transaminases, acute fulminant hepatitis and acute pancreatitis correlated with severity of Dengue fever.

In our study, elevation of liver enzymes (p=0.0004), acute pancreatitis and fulminant hepatitis (p=.000) had a significantly higher correlation with severity with p value <0.001.

DISCUSSION

Dengue fever usually presents as an acute febrile illness with musculoskeletal pain, and petechial rash. Atypical manifestations also known as expanded Dengue syndrome is not uncommon. It may present as acute abdomen leading to diagnostic dilemma.

In present study, we recruited 130 patients with serologically confirmed dengue fever. 30 patients were excluded from the study as they didn't satisfy the criteria.

Most of the patients were young individuals with mean age of patients being 32.98±12.4yrs**,** of them 77% were males and 23% were females. Study done by Khalil MA et.al., had a similar distribution with mean age being 35.2±14.7 years and two third of total population being males (70.9%)[6]. 56% of the patients were from urban areas and 44% of them were from rural population.

There were various manifestations in patients with dengue, of them 96% had GI manifestations which included both typical and atypical gastrointestinal manifestations. Nausea , vomiting, pain abdomen followed by diarrhea being most common GI symptoms.

In a study, most common GI symptoms noted were Nausea (43.3%), vomiting (40.2%), pain abdomen (41.3%), dyspepsia (32%) and loose stools (12%).[7] As compared to which, in our study GI symptoms were found in a greater number of patients.

In this study elevation of transaminases was found in 59% of the patients however, the severity of hepatitis was mild to moderate in the majority of the patients. Acute fulminant hepatitis was seen in 6% of patients. In a study liver enzyme AST was increased with the value more than 50 IU/ml in 78.4% and 96.5% of cases of DF and DHF respectively. Similarly, ALT value was raised in 53.8% of DF and 74.1% of DHF patients.[8]

Other manifestations observed in the study were acalculous cholecystitis (13%), ascites (24%), jaundice (18), hepatomegaly (14%), splenomegaly (6%), Acute fulminant hepatitis in 6%, Upper GI bleed in 6%, hepatomegaly in 4% and Acute pancreatitis in 4% of patients.

In a study 8.6% of patients with Dengue fever had acute cholecystitis, 8.6% acute viral hepatitis, 5.7% had acute appendicitis, 5.7% had acute pancreatitis.[9]

Of these GI manifestations nausea, vomiting, pain abdomen, GI bleed, jaundice, ascites, elevation of transaminases, acute fulminant hepatitis and acute pancreatitis correlated with severity of Dengue fever. In a study by Pain abdomen, abdominal tenderness, ascites, hepatomegaly and jaundice were predictors of need for Intensive care.[10]

All of our patients presented with fever (99%), malaise (83%), headache (72%), retro-orbital pain (56%), polyarthralgia (44%), and exanthemata's rash (38%). These findings were similar to a study by Tejaswi CN., in which most common symptom observed was fever (90.3%), headache(71.9%), skin rash (41.2%), myalgia (46.4%) etc.[11]

Thrombocytopenia was present in 92% of patients in this study with mean platelet count of 53900. In a study 90% of patients had a platelet count of <100 000/cmm, (48%) had a count<50 000/cmm.[12]

Bleeding manifestations were noted in (34%) of patients which included gum bleed, petechiae, GI bleed, hematuria predominantly in critical phase of the illness. In a study by Badshah A et.al., 36% of patients experienced minor bleeding diatheses in the form of nose bleeds, gum bleeding, petechial hemorrhages, blood in saliva etc. Only 2 (1%) patients developed major bleeding diatheses in the form of per rectal fresh bleeding, hematuria or intra-cranial bleed.[13] In our study none of the patients had life threatening bleeding diathesis.

Various non hemorrhagic complications are known to occur in patients having dengue with thrombocytopenia.[14] In our study 3% patients had Dengue encephalopathy, acute kidney injury was present in 22% of patients. 4% patients had acute respiratory distress syndrome. In a study two patients had acute kidney injury (2%), other complications found were acute respiratory distress syndrome (ARDS) (2%), meningoencephalitis (1%).[14]

Mortality noted in our study was 3%. Cause of death in all patients was Dengue shock syndrome with multiorgan dysfunction. These findings were similar to a study in which overall mortality was 3.85%, variables associated with increased risk of death among the dengue patients were Age >40 years, presence of hypotension, presence of renal failure, encephalopathy, MODS, ARDS and bleeding tendency.[15]

CONCLUSION

Gastrointestinal manifestations are very common in Dengue fever, in our study 96% of the patients had these symptoms. Atypical GI manifestations like acalculous cholecystitis, acute fulminant hepatitis, acute pancreatitis are quite common than once thought of, are often missed due to lack of awareness. Elevated transaminases and atypical GI manifestations like acute pancreatitis, acute fulminant hepatitis may indicate severe Dengue.

ACKNOWLEDGEMENTS

Authors would like to grateful to all patients who participated in our study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Yacoub S, Farrar J. Dengue. In: Farrar J, Hotez P editors. Manson's tropical diseases. 23rd edition. Edinburgh: Saunders Elsevier; 2014:162-170.
2. World Health Organization, Special Programme for Research, Training in Tropical Diseases, World Health Organization. Department of Control of Neglected Tropical Diseases, World Health Organization. Epidemic, Pandemic Alert. Dengue: guidelines for diagnosis, treatment, prevention and control. World Health Organization; 2009.
3. Gulati S, Maheshwari A. Atypical manifestations of dengue. Tropical Medicine & International Health. 2007 Sep;12(9):1087-95
4. Samanta J, Sharma V. Dengue and its effects on liver. World Journal of Clinical Cases: WJCC. 2015 Feb 16;3(2):125.
5. Jain V, Gupta OP, Rao T, Rao S. Acute pancreatitis complicating severe dengue. Journal of global infectious diseases. 2014 Apr;6(2):76.

6. Khalil MA, Sarwar S, Chaudry MA, Maqbool B, Khalil Z et.al., Acute kidney injury in dengue virus infection. Nephrology Dialysis Transplantation Plus. 2012 Oct 1;5(5):390-4.
7. Nimmagadda SS, Mahabala C, Boloor A, Raghuram PM, Nayak A. Atypical manifestations of dengue fever (DF)-where do we stand today?. Journal of clinical and diagnostic research: JCDR.2014 Jan;8(1):71
8. Sedhain A, Bhattarai GR, Adhikari S, Shrestha B, Sapkota A. Liver involvement associated with dengue infection during a major outbreak in central Nepal. Journal of Advances in Internal Medicine. 2013 Sep 29;2(2):42-6.
9. Tiwary IK, Das A, Goenka MK. Gastrointestinal spectrum of dengue fever in a dengue epidemic. Tropical Gastroenterology. 2017 Jun 5;37(3):203-7.
10. Ooi ET, Ganesanathan S, Anil R, Kwok FY, Sinniah M. Gastrointestinal manifestations of dengue infection in adults. Med J Malaysia. 2008 Dec;63(5):401-5.
11. Tejaswi CN, Patil SS, Shekharappa KP. Study of clinical manifestations of dengue cases in a tertiary care hospital, Bangalore, Karnataka. International Journal of Medical Science and Public Health. 2016;5(12);2503-7.
12. Daniel R, Philip AZ. A study of Clinical Profile of Dengue Fever in Kollam, Kerala, India. Dengue bulletin. 29.2005(5):196-200.
13. Badshah A, Subhan S, Mohammad W, Khan Z. Clinical outcome of Dengue fever among patients admitted in tertiary care hospital Peshawar. J Medical Scie. 2019 Mar 29;27(1):25-9.
14. Jayanthi HK, Tulasi SK. Correlation study between platelet count, leukocyte count, nonhemorrhagic complications, and duration of hospital stay in dengue fever with thrombocytopenia. Journal of family medicine and primary care. 2016 Jan;5(1):120.
15. Acharya V, Khan MF, Kosuru S, Mallya S. Predictors of mortality in adult patients with dengue: a study from South India. International Journal of Research in Medical Sciences. 2018 May;6(5):1605-10.

Cite this article as: Prashanth VN, Manasa G . Study of gastrointestinal manifestations in Dengue fever. Int J Adv Med 2019;6:1476-81.