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FREQUENCY OF TRANSAMINITIS IN PATIENTS WITH DENGUE FEVER AND ASSOCIATION WITH DISEASE SEVERITY

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ABSTRACT

Introduction: While dengue fever is prevalent in our country, local studies focusing on the association between liver enzyme abnormalities are scarce as evident from thorough literature searches. Hence the study was planned. Results of the study would provide vital information about liver enzyme derangements with dengue fever which would help clinicians in better management and patient counselling.

Objective: To determine the frequency of transaminitis and the association of transaminitis with disease severity in patients with dengue fever.

Materials and methods: This descriptive cross sectional study was carried out at the Department of Medicine, Shifa International Hospital, Islamabad during the period 5th November 2024 till 28th February 2025. A total of 192 male and female patients in the age range 18 to 70 years diagnosed with dengue fever were enrolled and their blood samples were analyzed for transaminitis.

Results: Mean age was 37.23±10.402 years. Majority of the participants were aging less than 40 years (n = 117, 60.9%). Male patients were 143 (74.5%). 91 patients had severe disease (47.4%) and 98 patients had transaminitis (51.0%). The p value for association between transaminitis and severe disease was 0.000 (<0.05).

Conclusion: Liver injury is common in patients with dengue fever. Patients with higher level of liver enzymes are more likely having severe disease.

KEYWORDS: Dengue Fever, Severity of Dengue Fever, Transaminitis

INTRODUCTION

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Dengue fever is an arthropod borne viral infection caused by Dengue virus and spread by mosquitoes belonging to the family Aedes.[1] There are four serological variants of dengue virus from 1 to 4. Clinical spectrum of dengue fever is variable ranging from mild fever to severe hemorrhages and shock commonly known as dengue hemorrhagic fever.[2] Dengue virus resides in tropical and sub-tropical countries. Dengue fever is endemic in our country with episodic outbreaks. [3,4]

Clinical features alone cannot be used to establish diagnosis owing to overlap with clinical signs and symptoms with several other tropical diseases, infectious and non-infectious diseases. Though PCR for viral RNA is gold standard, it is seldomly required due to availability of relatively inexpensive serological tests for viral antigens and viral specific antibodies. Viral culture is almost never required.[5,6]

Liver is almost invariably involved in dengue fever. Severity of liver injury may range from mild symptomatic enzyme elevation to jaundice and acute or subacute liver failure in severe cases.[7] There is no specific therapy for dengue fever and treatment is mostly symptomatic. The disease is self-limiting and the infection doesn't provide immunity against future infections. [8] Some recent studies have reported that serum transaminase levels are elevated in the majority of the patients with dengue fever and thus can aid in differential diagnosis.[8] Revappa et al. conducted a study on frequency of transaminitis in patients with dengue fever and reported transaminitis in 96.2% patients.[9] While a study by Chitkara et al. reported transaminitis in 84.1% patients. [10] In a study by Swammy et al, the frequency of transaminitis of in dengue fever was 74.2%. 57.6% patients with dengue fever with transaminitis were found having severe disease. The p value for association between disease severity and transaminitis was <0.001.[11]

Gaining a comprehensive knowledge of the processes behind liver involvement in dengue fever, specifically focusing on the temporal progression of hepatic enzyme abnormalities and its association with disease severity. While dengue fever is prevalent in our country, local studies focusing the association between liver enzyme abnormalities are scarce as evident from thorough literature search. Hence the study has been planned. Results of the study would provide vital information about liver enzyme derangements with dengue fever which would help clinicians in better management and counselling of their patients seeking care for dengue infection.

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MATERIALS AND METHODS

This descriptive cross sectional study was performed at the department of Medicine, Shifa International Hospital, Islamabad, during the period 5th November 2024 till 28th February 2025. Male and female patients in the age range 18 to 70 years diagnosed with dengue fever were enrolled. Patients with viral hepatitis, malignancy, cerebrovascular disease, ischemic heart disease, alcoholic hepatitis and metabolic liver disease were excluded. Dengue fever was diagnosed when patient was complaining of fever and dengue serology was positive for IgM antibodies by ELISA. Transaminitis was defined when serum ALT level was greater than 64IU/L and AST greater than 42IU/L. Dengue fever with the presence of low GCS (GCS <13/15) or shock (MAP < 70mmHg) was called severe dengue fever. Sample size was 192 calculated using Open Epi software and sampling technique was non-probability convenient sampling.

Participants were enrolled after taking permission from CPSP and hospital research review committee. Informed consent was taken and baseline demographics and clinical features were noted. 05 cc blood sample was taken from patient and sent to hospital lab for determination of AST and ALT. Level of consciousness of patient was determined using Glasgow Coma Scale. Blood pressure of the patient was recorded while the patient has rested for 10 minutes and lying supine and mean arterial pressure was calculated using the formula MAP = [2 (diastolic BP) + (systolic BP)] / 3.

Data was analyzed using SPSS version 26. Descriptive statistics was carried out to report continuous data and categorical data as frequencies and percentages. Tests of statistical significance included chi square or Fisher exact test at 5% level of significance. P value ≤0.05 was considered statistically significant.

RESULTS

Descriptive statistics of patients is reported in table 1. Mean age was 37.23±10.402 years and mean BMI was 24.9±1.804 kg/m^2.

Table 1. Mean ± SD of patients according to baseline characteristics (n = 192)

Parameters	Mean	Std. Deviation
Age (years)	37.23	10.402

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BMI (kg/m^2)	24.9823	1.80473
ALT (IU/L)	131.6719	69.05845

Majority of the participants were aging less than 40 years (n = 117, 60.9%). Male patients were 143 (74.5%). Participants with BMI 25.0 or below kg/m^2 were 117 (60.9%). 91 patients had severe disease (47.4%) and 98 patients had transaminitis (51.0%). (Table 2)

Table 2. Frequencies and percentages of patients according to baseline parameters (n = 192)

Parameters		Frequency	Percent
Age (years)	40 or below	117	60.9
	Above 40	75	39.1
Gender	Male	143	74.5
	Female	49	25.5
BMI (kg/m^2)	25.0 or below	117	60.9
	More than 25.0	75	39.1
Severity	Non-severe	101	52.6
	Severe	91	47.4
Transaminitis	No	94	49.0
	Yes	98	51.0

Association between disease severity is reported in table 3. Out of the total 91 patients with severe disease, 73 patients (80.2%) had transaminitis. The chi square p value for association between disease severity and transaminitis was 0.000.

Table 3. Contingency table analysis for association between disease severity and transaminitis (n = 192)

		Transaminitis		Total	P value
		No	Yes		
Severity	Non severe	76	25	101	0.000
		75.2%	24.8%	100.0%	

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	Severe	18	73	91	
		19.8%	80.2%	100.0%	
Total		94	98	192	
		49.0%	51.0%	100.0%	

DISCUSSION

Mean age of the participants 37.23±10.402 years and Majority of the participants were aging less than 40 years (n = 117, 60.9%). Mean age in study by Swamy et al was 34.8±15.1 years and 50.08% participants were aging below 40 years.[11] This is similar to our observations. Mean age in study by Gandhi et al was 34.3±15.0 years and participants aging 30 to 40 years constituted major portion of the study cohort which is agreement with our findings.[12]

Male patients outnumbered female in our study. In study by Swamy et al, male participants were higher in number than female (75 versus 45).[11] This is in coherence to our observations. Gender wise distribution (male predominance) in our study is similar to other several Asian studies.[13,14]. However our study results are in contrast to Guha et al where female patients were more in number than male.[15] Male dominance with dengue infection may be due to socio-cultural reasons where females most remain inside their homes. It may also be due to certain professions potentially exposing male to risk of dengue.

Elevated liver enzymes (transaminitis) were observed in 51.0% patients in our study. In study by Swamy and colleagues, 50.8% patients with dengue fever had transaminitis which is similar to our observations.[11] Transaminitis was observed in 50.0% patients in study by Saha et al.[16] In study by Souza et al, 45.0% patients were found with elevated liver enzymes.[17] Tiwari and colleagues reported much higher prevalence (91.0%) of transaminitis in their study.[18] Elevation of liver enzymes in dengue fever is common. The underlying pathophysiology is complex and multifactorial. It may be the direct effect of viral toxins or immune mediated injury to the hepatocytes.

Spectrum of hepatic injury in dengue fever is variable ranging from mild symptomatic liver enzymes elevation to acute liver failure with hepatic encephalopathy, septicemia/shock and death.

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Severe was recorded in 91 patients (47.4%) in our study. The chi square p value for association between disease severity and transaminitis was 0.000. Swamy et al attributed higher liver enzymes level to poor disease outcomes in dengue fever.[11] Transaminitis was concluded as marker of severe disease other studies.[19,20]

CONCLUSION

It can be concluded that liver injury indicated by elevated liver is common is dengue fever. It was observed in slightly higher than half of the participants. Transaminitis was more prevalent in patients with severe dengue fever (presence of shock or low GCS). Association between transaminitis and disease severity was statistically significant.

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