

**How to Cite:**

Khan, J. U. A., Wahab, A., Jhagra, S. K., Haris, M., Jehangir, S., & Ali, S. (2023). Prevalence of acute hepatitis in dengue patients. *International Journal of Health Sciences*, 6(S8), 6904–6908. <https://doi.org/10.53730/ijhs.v6nS8.14062>

## Prevalence of acute hepatitis in dengue patients

**Jibran Umar Ayub Khan**

Department of Medicine Kabir Medical College Peshawar

**Dr Abdul Wahab**

Department of Medicine MMC General Hospital Peshawar

Corresponding author email: [drwahab22@gmail.com](mailto:drwahab22@gmail.com)

**Shahbaz Khan Jhagra**

Department of Medicine MMC General Hospital Peshawar

**Mohammad Haris**

Department of Medicine MMC General Hospital Peshawar

**Samama Jehangir**

Department of Medicine MMC General Hospital Peshawar

**Soma Ali**

Department of Medicine MMC General Hospital Peshawar

**Abstract**---Background: Dengue is the most common disease that has caused mortality throughout Pakistan as it can cause diversified complications ranging from slightly deranged liver function tests to acute hepatitis and liver failure. Objective: To determine the prevalence of acute hepatitis in dengue patients. Methods: We conducted a cross-sectional study from September to November 2022 at department of Medicine of MMC General Hospital a tertiary-care hospital of Kabir Medical College Peshawar. A proper approval was taken from research ethical committee of the hospital. The inclusion criteria were patients of dengue and exclusion was all patients having deranged liver function tests due to other causes such drug induced liver injury and acute viral hepatitis. The total sample size was 81 patients and non probability convenient sampling technique was used. The data was analyzed by using SPSS latest version. Results: ALT, ALP and Bilirubin was compared in age groups of patients. Results showed no significant difference for ALT, ALP and Bilirubin at baseline and at 3<sup>rd</sup> day of admission in all age groups as seen in above table. Patients in younger age group had the highest value for ALT at 3<sup>rd</sup> day of admission and ALP highest value was seen in patients in age group 29-42 years and highest value of bilirubin was seen in patients in the elderly age groups. Although statistically significant difference was not

seen but ALT, AST and Bilirubin showed variation with respect to age of patients. Conclusion: The frequency of acute hepatitis in dengue patients is high is shown by deranged liver function tests. Acute hepatitis by itself can lead to a large number of complications and so early diagnosis and treatment of such patients is important.

**Keywords**---acute hepatitis, dengue fever, bilirubin.

## **Introduction**

Dengue fever is viral infection transmitted by *Aedes aegypti* that can cause acute febrile illness with a fever of more than 100 F, retroorbital headache, generalized body aches and pains.<sup>1</sup> Severe dengue is leading cause of deaths throughout the world and it presents in various forms and manifestations like dengue hemorrhagic fever and dengue shock syndrome.<sup>2</sup> Other sequelae include compromised haematological cell lines leading to predominantly thrombocytopenia and even pancytopenia. The platelets counts can go to as low as zero.

Dengue fever can affect different systems and liver is not an exception. The liver involvement has different presentations.<sup>3</sup> Most of the times a mild derangement of essential liver function tests with spontaneous resolution in due course of time is the outcome in a large number of patients. But in some instances complications such as acute hepatitis, fulminant hepatic failure and even encephalopathy like picture ensue leading to the demise of the patients.<sup>1</sup> Patients can experience typical signs and symptoms of acute hepatitis including anorexia, nausea, vomiting, fever and clinical jaundice. Increased level of bilirubin is a regular phenomenon and it should be a usual practice to screen such patients.<sup>4</sup> Since DF has been a regular occurrence in Pakistan and very little is known about the severity of acute hepatitis and its consequences in case of involvement of liver. Other complications like haemolytic uremic syndrome, disseminated intravascular coagulation, encephalopathy, myocarditis and a neurological disease such as Guillain Barre Syndrome is a good enough reason for it to be researched in our local context.

## **Methodology**

This was a cross-sectional study in the department of Medicine of MMC General Hospital a tertiary-care hospital of Kabir Medical College Peshawar. A proper approval was taken from research ethical committee of the hospital. The inclusion criteria was patients of dengue and exclusion was all patients having deranged liver function tests due to other causes such drug induced liver injury and acute viral hepatitis. The total sample size was 81 patients and non probability convenient sampling technique was used. The pros and cons of the study were explained to all the participants in detail and they were given a choice to voluntarily withdraw from the study if they wish to do so. Liver Function Tests were done on the day of the admission and then on 3<sup>rd</sup> day and then both the results were compared in terms of different variations of liver function tests. The data was analyzed by using SPSS latest version. Frequencies and percentages

were used for categorical data and p value of less than 0.05 was taken as significant

## Results

In this study total 83 confirmed dengue patients were included. Among these patients 24(28.9%) were male and 59(71.1%) were female. Mean age of these patients was 33.24±11.12 years. Age of patients ranges between 14-56 years respectively.

Tabel-1: Liver function parameters at admission and on 3<sup>rd</sup> Day postadmission

	At Admission	3 <sup>rd</sup> Day Post Admission	Mean increase	p-value*
	83	83	83	
ALT (Units)	109.22±92.51	346.29±220.69	237.07±176.04	<0.001
ALP (Units)	246.36±117.77	399.04±175.99	152.67±135.75	<0.001
Bilirubin (Units)	1.32±0.44	3.49±1.44	2.17±1.33	<0.001

Note: Wilcoxon Signed Rank Test

Normality assessment was carried out for all variables in the data. Data was not normally distributed so we go for non-parametric test. All variables ALT, ALP and Bilirubin showed significant increase in at 3<sup>rd</sup> day of admission. Mean increase in ALT and ALP was 237.07 and 152.67 while for Bilirubin mean increase was 2.17 respectively.

Table-2: Comparison of Liver function parameters among male and female patients

		Male	Female	p-value*
		24	59	
ALT (Units)	At Admission	96.79±86.80	114.27±94.98	0.320
	Post Admission	379.17±272.13	332.92±197.13	0.876
ALP(Units)	At Admission	243.00±74.60	247.73±131.89	0.771
	Post Admission	428.00±166.81	387.25±179.63	0.198
Bilirubin (Units)	At Admission	1.12±0.43	1.40±0.42	0.013
	Post Admission	3.41±1.19	3.52±1.54	0.864

Note: \*: Mann Whitney U Test

No statistically significant difference was seen for ALT, ALP and Bilirubin level between male and female patients at admission as well as at 3<sup>rd</sup> day post admission of patients. However male patients had higher value of ALT, ALP while bilirubin level was higher among female patients.

Table-3: Comparison of Liver function parameters in relation to age of patients

		ALT		Alkaline Phosphatase		Bilirubin	
		Baseline	3 <sup>rd</sup> Day	Baseline	3 <sup>rd</sup> Day	Baseline	3 <sup>rd</sup> Day
Age	14-28	115.87±97.00	384.51±274.73	228.03±69.72	376.93±116.04	1.24±0.42	3.17±1.06
	29-42	108.87±107.42	339.42±201.74	253.90±131.94	442.30±218.18	1.32±0.48	4.01±1.74
	43-56	98.94±50.987	295.84±135.73	263.15±152.14	359.94±167.72	1.43±0.36	3.10±1.13
p-value		0.556	0.854	0.859	0.299	0.349	0.094

ALT, ALP and Bilirubin was compared in age groups of patients. Results showed no significant difference for ALT, ALP and Bilirubin at baseline and at 3<sup>rd</sup> day of admission in all age groups as seen in above table. Patients in younger age group had the highest value for ALT at 3<sup>rd</sup> day of admission and ALP highest value was seen in patients in age group 29-42 years and highest value of bilirubin was seen in patients in the elderly age groups. Although statistically significant difference was not seen but ALT, AST and Bilirubin showed variation with respect to age of patients.

### Discussion

Dengue emergence in Pakistan is since 2010 especially after the major outbreak of floods in Punjab and Khyber Pakhtunkhwa, the two major provinces where the cases enhanced at an alarming pace.<sup>1</sup> Most the patients died due to novelty of the viral infection at that time and lack of expertise of the staff as well overstretched health systems. A study was done on 133 patients admitted at Department of Medicine Agha University Hospital Karachi in which 5 mortalities and there was significant deranged with median initial ALT and subsequent ALT were 398 U/L and 2107U/L amongst the patients who passed away. In our results no statistically, significant difference was seen for ALT, ALP and Bilirubin level between male and female patients at admission as well as at 3<sup>rd</sup> day post admission of patients. However male patients had higher value of ALT, ALP while bilirubin level was higher among female patients.

ALT, ALP and Bilirubin showed significant increase in at 3<sup>rd</sup> day of admission. Mean increase in ALT and ALP was 237.07 and 152.67 while for bilirubin mean increase was 2.17 respectively. Supporting these results, a study explored about 270 cases who were dengue positive. According to the results, nearly 90% of the them did have derangement of AST as compared to ALT, gamma-glutamyl transferase, alkaline phosphatase as well as bilirubin (80%, 83%, 16% and 7%, respectively).<sup>7</sup> Another study done on 1,585 patients in Brazil came to a conclusion that there were greater changes in the AST levels when compared to ALT (63.4% vs. 45%).<sup>8</sup>

As per Bowman et al., the liver involvement in dengue is more prevalent in women, children and patients with severe manifestations of dengue.<sup>9</sup> There can be even more dangerous in more patients who receive hepatotoxic drugs due to sheer ignorance or sometimes negligence of the attending doctors. However according to one study, the impact of paracetamol of patients with dengue didn't cause any significant derangement of liver function tests.<sup>5</sup> The limitations of this study include that data collection was done from a single centre that is MMC

General Hospital Peshawar which is a bias in its own self. This can be avoided by conducting studies in larger centers in multiple cities with comparison of fatal and nonfatal cases and clinical and laboratory findings.

### Conclusion

This study proved that there is a greater prevalence of acute hepatitis in patients with dengue infection. It will not be wrong to say that liver function tests should be routinely monitored in such patients to prevent hazardous complications.<sup>10</sup>

### References

1. Bosan A, Qureshi H, Bile KM, Ahmad I, Hafiz R. A review of hepatitis viral infections in Pakistan. *J Pak Med Assoc.* 2010;60(12):1045–58.
2. Bowman LR, Runge-Ranzinger S, McCall PJ. Assessing the Relationship between Vector Indices and Dengue Transmission: A Systematic Review of the Evidence. *PLoS Negl Trop Dis.* 2014;8(5).
3. Castaneda D, Gonzalez AJ, Alomari M, Tandon K, Zervos XB. From hepatitis A to E: A critical review of viral hepatitis. *World J Gastroenterol.* 2021;27(16):1691–715.
4. Codeco CT, Oliveira SS, Ferreira DAC, Riback TIS, Bastos LS, Lana RM, et al. Fast expansion of dengue in Brazil. *Lancet Reg Heal - Am* [Internet]. 2022;12:100274. Available from: <https://doi.org/10.1016/j.lana.2022.100274>
5. Firmansyah MA. Dengue Hemorrhagic Fever with Acute Fulminant Hepatitis: A Case Report. *Indones J Gastroenterol Hepatol Dig Endosc.* 2020;18(3):197–201.
6. Ishtiaq R, Imran A, Raza H, Anwar Q, Ishtiaq D, Jamil A, et al. Acute Hepatitis in Infections Caused by Dengue Virus in Southern Punjab, Pakistan. *Cureus.* 2018;10(12).
7. Liang PC, Chen KY, Huang CH, Chang K, Lu PL, Yeh ML, et al. Viral interference between dengue virus and hepatitis C virus infections. *Open Forum Infect Dis.* 2020;7(8):1–8.
8. Siddiqui T, Saadat A, Ameen AM. Devastating flood emergency in Pakistan- a recent threat to country's health care system. *Ann Med Surg* [Internet]. 2022;82(August):104633. Available from: <https://doi.org/10.1016/j.amsu.2022.104633>
9. Souza LJ, Coelho JMCO, Silva EJ, Abukater M, Almeida FCR, Fonte AS, et al. Acute hepatitis due to dengue virus in a chronic hepatitis patient. *Brazilian J Infect Dis.* 2008;12(5):456–9.
10. Syed AA, Aslam F, Hakeem H, Siddiqui F, Nasir N. Frequency of worsening liver function in severe dengue hepatitis patients receiving paracetamol: A retrospective analysis of hospital data. *J Pak Med Assoc.* 2017;67(3):400–4.