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**ORIGINAL RESEARCH**

# Hepatic manifestations and their correlation with severity in patients with dengue fever

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## ABSTRACT

**Background:** Dengue is the most serious arboviral illness in humans. Over the past few decades, there has been a significant increase in the prevalence of dengue fever (DF) and dengue hemorrhagic fever (DHF) worldwide. The present study evaluated hepatic manifestations in dengue fever and their correlation with severity of dengue fever. **Materials & Methods:** 76 cases of dengue fever of both genders were selected. Hemoglobin, hematocrit, platelet count, total and differential leukocyte count, liver function tests, and urine analysis were among the parameters evaluated. **Results:** Out of 76 patients, 40 were males and 36 were females. Common symptoms in patients with DF, DHF I, DHF II, DHF III and DHF IV was headache was seen in 12, 7, 11, 18 and 8 respectively. Body pain was seen in 8, 6, 8, 14 and 7, vomiting in 5, 4, 7, 11 and 4, retro-orbital pain in 9, 3, 6, 17 and 3 patients respectively. Jaundice in 6, 8, 5, 19 and 5 patients respectively. The difference was significant (P< 0.05).AST (SGOT) >50 IU/L was seen in 9, 6, 12, 4 and 7 patients. ALT (SGPT) >50 IU/L in 11, 5, 13, 6 and 8. S. Alkaline P. >200 IU/L in 3, 4, 6, 5 and 1 patient. The mean hemoglobin level was 10.1, 10.4, 11.5, 10.6 and 10.8. Haematocrit was 32.4, 31.2, 32.6, 32.0 and 32.8. Bilirubin was 0.61, 0.54, 0.67, 0.75 and 0.78 in DF, DHF I, DHF II, DHF III and DHF IV, respectively. The difference was significant (P< 0.05). **Conclusion:** Epidemics of dengue are occurring more frequently. Different levels of hepatic involvement have been reported. Since dengue is a transient and curable illness, early diagnosis of hepatic impairment could help avoid potentially catastrophic outcomes.

**Keywords:** dengue, hepatic, Jaundice



## INTRODUCTION

Dengue is the most serious arboviral illness in humans. Over the past few decades, there has been a significant increase in the prevalence of dengue fever (DF) and dengue hemorrhagic fever (DHF) worldwide.[1] In India, epidemics are happening more regularly. The involvement of younger age groups and the frequency of outbreaks are indicators of higher infection incidence.[2] If untreated, DF complications can result in up to 20% of deaths; however, if detected early and treated properly, mortality falls to less than 1%. Clinical suspicion is based on the prevalence of symptoms in the population, which highlights the significance of early diagnosis.[3]

Public health measures are implemented or adjusted in response to new facts about the illness. Therefore, it is essential to document the disease's many presentations and gather descriptive data during each pandemic.[4] There are at least four distinct antigenic types in the Flaviviridae family of viruses, which includes the dengue viruses DEN 1, DEN 2, DEN 3, and DEN 4.[5] Some of the reasons that contribute to the growth of dengue include unchecked urbanization, overcrowding, inadequate health care, increased travel to dengue-affected areas, insufficient vector management, climate change, and low public awareness. It is commonly known that dengue infections can cause a variety of clinical signs, ranging from asymptomatic illness to fatal outcomes.[6]The present study evaluatedhepatic manifestations in dengue fever and their correlation with severity of dengue fever.

## MATERIALS & METHODS

The present study consisted of76 cases of dengue fever of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Hemoglobin, hematocrit, platelet count, total and differential leukocyte count, liver function tests, and

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urine analysis were among the parameters evaluated. A chest X-ray was done to show pleural effusion, and daily complete blood counts, including hematocrit, were performed during the acute phase of the disease.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

## RESULTS

**Table I Distribution of patients**

| Total- 76 | | |
|---|---|---|
| **Gender** | **Male** | **Female** |
| Number | 40 | 36 |

Table I shows that out of 76 patients, 40 were males and 36 were females.

**Table II Clinical findings**

| Clinical findings | DF | DHF I | DHF II | DHF III | DHF IV | P value |
|---|---|---|---|---|---|---|
| **Number** | 15 | 10 | 19 | 22 | 10 | |
| Headache | 12 | 7 | 11 | 18 | 8 | 0.05 |
| Body pain | 8 | 6 | 8 | 14 | 7 | |
| Vomiting | 5 | 4 | 7 | 11 | 4 | |
| Retro-orbital pain | 9 | 3 | 6 | 17 | 3 | |
| Jaundice | 6 | 8 | 5 | 19 | 5 | |

Table II shows that common symptoms in patients with DF, DHF I, DHF II, DHF III and DHF IV was headache was seen in 12, 7, 11, 18 and 8 respectively. Body pain was seen in 8, 6, 8, 14 and 7, vomiting in 5, 4, 7, 11 and 4, retro-orbital pain in 9, 3, 6, 17 and 3patients respectively. Jaundice in 6, 8, 5, 19 and 5 patients respectively. The difference was significant (P< 0.05).

**Graph I Clinical findings**

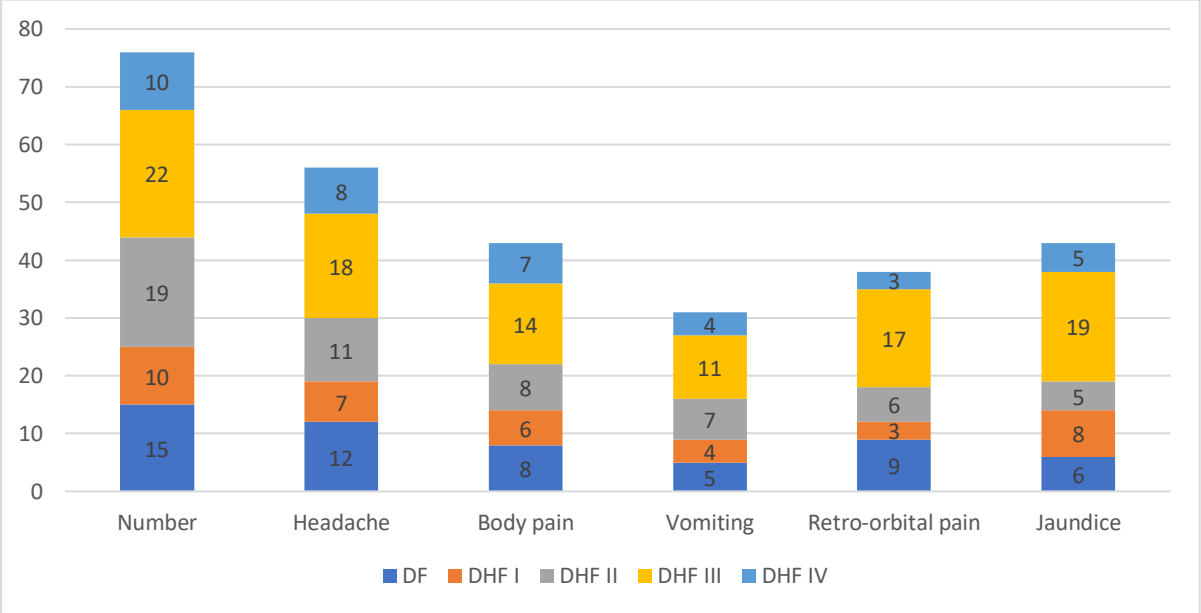


**Table III Analysis of laboratory investigations**

| Investigations | DF | DHF I | DHF II | DHF III | DHF IV | P value |
|---|---|---|---|---|---|---|
| AST(SGOT) >50 IU/L | 9 | 6 | 12 | 4 | 7 | 0.81 |
| ALT(SGPT) >50 IU/L | 11 | 5 | 13 | 6 | 8 | 0.05 |
| S. Alkaline P.>200 IU/L | 3 | 4 | 6 | 5 | 1 | 0.76 |
| Hemoglobin (g/dL) | 10.1 | 10.4 | 11.5 | 10.6 | 10.8 | 0.05 |
| Haematocrit | 32.4 | 31.2 | 32.6 | 32.0 | 32.8 | 0.03 |
| Bilirubin(mg/dl) | 0.61 | 0.54 | 0.67 | 0.75 | 0.78 | 0.04 |

Table II shows that AST (SGOT) >50 IU/Lwas seen in 9, 6, 12, 4and7patients. ALT (SGPT) >50 IU/L in 11, 5, 13, 6 and 8. S. Alkaline P. >200 IU/L in 3, 4, 6, 5and 1 patient. The mean hemoglobin level was 10.1, 10.4, 11.5, 10.6 and 10.8. Haematocrit was 32.4, 31.2, 32.6, 32.0 and 32.8. Bilirubin was 0.61, 0.54, 0.67, 0.75 and 0.78in DF, DHF I, DHF II, DHF III and DHF IV, respectively. The difference was significant (P< 0.05).

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## DISCUSSION

Dengue infection is one of the most common illnesses in the world that is carried by mosquitoes. Compared to previous Indian studies, this one reveals a narrower age group affected by dengue illness and its aftereffects.[7] This supports the idea that dengue fever is spreading throughout India. Among dengue subgroups, there is a definite trend toward DSS developing earlier in life.[8] During the rainy season, mosquito larvae numbers significantly increase. This could be one of the reasons why dengue outbreaks typically occur during the rainy season.[9] Additionally, mosquitoes' ability to spread viruses is influenced by ambient temperature and relative humidity, with rates being highest in regions that resemble the rainy season. The period to acute viraemia in female mosquitoes is likewise influenced by environmental temperatures, with a shorter period.[10,11,12]The present study evaluated hepatic manifestations in dengue fever and their correlation with severity of dengue fever.

We found that out of 76 patients, 40 were males and 36 were females.Potts et al[13] found that patients with dengue had significantly lower platelet, white blood cell (WBC) and neutrophil counts, and a higher frequency of petechiae than OFI patients. Higher frequencies of myalgia, rash, haemorrhagic signs, lethargy/prostration, and arthralgia/joint pain and higher haematocrits were reported in adult patients with dengue but not in children. Most multivariable models included platelet count, WBC, rash, and signs of liver damage; however, none had high statistical validity and none considered changes in clinical features over the course of illness.

We observed that common symptoms in patients with DF, DHF I, DHF II, DHF III and DHF IV was headache was seen in 12, 7, 11, 18 and 8 respectively. Body pain was seen in 8, 6, 8, 14 and 7, vomiting in 5, 4, 7, 11 and 4, retro-orbital pain in 9, 3, 6, 17 and 3 patients respectively. Jaundice in 6, 8, 5, 19 and 5 patients respectively. The clinical, biochemical, and hematological characteristics of dengue fever were examined by Shekar GC et al.[14] The study included 100 individuals who were hospitalized to our hospital with a fever and tested positive for immunoglobulin M dengue. 81 (81%) of the 100 patients had a dengue fever diagnosis. The majority of patients had characteristic symptoms, including fever, arthralgias, abdominal discomfort, headache, vomiting, rash, and bleeding. Dengue is primarily treated with supportive care. However, the disease's outcome is significantly influenced by proper fluid management.

We observed thatAST (SGOT) >50 IU/L was seen in 9, 6, 12, 4 and 7 patients. ALT (SGPT) >50 IU/L in 11, 5, 13, 6 and 8. S. Alkaline P. >200 IU/L in 3, 4, 6, 5 and 1 patient. The mean hemoglobin level was 10.1, 10.4, 11.5, 10.6 and 10.8. Haematocrit was 32.4, 31.2, 32.6, 32.0 and 32.8. Bilirubin was 0.61, 0.54, 0.67, 0.75 and 0.78 in DF, DHF I, DHF II, DHF III and DHF IV, respectively. Faridi et al[15] found that all patients presented with fever and hepatomegaly. Examination also revealed splenomegaly in 11 (32.4%), ascites in 6 (17.6%) and pleural effusion in 3 (8.8%). Common bleeding manifestations were positive tourniquet test in 22 (64.7%) and epistaxis in eight (23.5%). Most children had a platelet count of between 20,000/mm(3) and 50,000/mm(3) (56%). Bleeding manifestations were not related to platelet count ($P > 0.05$). Serum glutamic pyruvic transaminase (SGPT) >40 IU/L was seen in 22 (64.6%) patients, alkaline phosphate (ALP) >400 IU/L in 12 (35.3%) and serum bilirubin >1 mg% in 3 (8.8%). IgM dengue serology was positive in 68.5% cases. There was no significant difference in liver function tests with age or sex ($P > 0.05$). Clinical features of DHF varied from the previous epidemic. Hepatic dysfunction with increased levels of serum enzymes was common in DHF.

The shortcoming of the study is small sample size.

## CONCLUSION

Authors found that epidemics of dengue are occurring more frequently. Different levels of hepatic involvement have been reported. Since dengue is a transient and curable illness, early diagnosis of hepatic impairment could help avoid potentially catastrophic outcomes.

## REFERENCES

1. Aggarwal A, Chandra J, Aneja S, Patwari AK, Dutta AK. An epidemic of dengue hemorrhagic fever and dengue shock syndrome in children in Delhi. Ind Pediatr. 1998;35:727-32.
2. Dhanwada S, Reddy RSS. A study of various hepatic manifestations in dengue fever and their correlation with severity of dengue fever. Int J ContempPediatr2020;7:527-31.
3. Kalayanarooj S, Vaughn DW, Nimmannitya S, Green S, Suntayakorn S, Kunentrasai N, et al. Early clinical and laboratory indicators of acute dengue illness. J Infect Dis. 1997;176:313-21.
4. Wali JP, Biswas A, Aggarwal P, Wig N, Handa R. Validity of tourniquet test in dengue hemorrhagic fever. J Assoc Physicians India. 1999;47:203-04.
5. Kuo CH, Tai DI, Chang-Chien CS, Lan CK, Chiou SS, Liaw YF. Liver biochemical tests and dengue fever. Am J Trop Med Hyg. 1992;47:265-70.
6. Gomber S, Ramachandran VG, Kumar S, Agarwal KN, Gupta P, Gupta P, et al. Hematological observations as diagnostic markers in dengue hemorrhagic fever - a reappraisal. Ind Pediatr. 2001;38:477-81.
7. Bethell DB, Gamble J, Loc PP, Dung NM, Chau TTH, Loan HT, et al. Non-invasive measurement of microvascular leakage in patients with dengue hemorrhagic fever. Clin Infect Dis. 2001;32:243-53.
8. Pushpa V, Venkatadesikalu M, Mohan S, Cherian T, John TJ, Ponnuraj EM. An epidemic of dengue haemorrhagic fever/dengue shock syndrome in tropical India. Ann Trop Pediatr. 1998;18:289-93.
9. Narayanan M, Aravind MA, Ambikapathy P, Prema R, Jeyapaul MP. Dengue Fever-Clinical and Laboratory Parameters Associated with Complications. Dengue bulletin. 2003;27.

DOI: 10.69605/ijlbpr_14.2.2025.36

10. Itha S, Kashyap R, Krishnani N, Saraswat VA, Choudhuri G, Aggarwal R. Profile of liver involvement in dengue virus infection. Natl Med J India. 2005;18(3):127.
11. Mohan B, Patwari AK, Anand VK. Hepatic dysfunction in childhood dengue infection. J Trop Paediatr. 2000;46:40-3.
12. Souza LJ, Alves JG, Nogueira RM, Gicovate Neto C, Bastos DA, Siqueira EW, et al. Aminotransferase changes and acute hepatitis in patients with dengue fever: analysis of 1,585 cases. Braz J Infect Dis. 2004 Apr;8(2):156-63.
13. Potts JA, Rothman AL. Clinical and laboratory features that distinguish dengue from other febrile illnesses in endemic populations. Tropical Medicine & International Health. 2008 Nov;13(11):1328-40.
14. Shekar GC, Amaravadi A. Clinical, Biochemical and Hematological Profile in Dengue Fever. Inter J Scientific Study. 2016 Oct 1;4(7):144-9.
15. Faridi MM, Aggarwal A, Kumar M, Sarafrazul A. Clinical and biochemical profile of dengue haemorrhagic fever in children in Delhi. Trop Doct. 2008;38(1):28-30.