

A Prospective Study to Correlate CRP Levels with Incidence of Liver Injury in Dengue Fever in A tertiary care centre amongst Indian population Demographic

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ABSTRACT

Background:

Dengue fever remains a significant public health issue in India, with liver injury being a common complication. C-reactive protein (CRP), an acute-phase inflammatory biomarker, may have potential utility in predicting hepatic involvement in dengue. This study aimed to assess the correlation between CRP levels and liver injury in patients with dengue fever.

Methods:

This prospective study was conducted at a tertiary care center and included 25 patients diagnosed with dengue fever (IgM or NS1-positive by ELISA). All patients underwent CRP testing and liver function tests (LFTs). Liver injury was defined as an elevation of AST and ALT levels above 49 U/L. Patients were categorized into CRP-reactive and CRP-non-reactive groups for analysis.

Results:

Of the 25 patients, 14 were male and 11 were female. Twelve patients were CRP-reactive, while 13 were CRP-non-reactive. Liver injury was observed in 9 patients. Among the CRP-reactive group, 7 patients (58.3%) had elevated AST and ALT levels, whereas only 2 patients (15.4%) in the CRP-non-reactive group showed such elevations. This indicates a higher incidence of liver injury among CRP-reactive patients.

Conclusion:

The study suggests that elevated CRP levels are associated with a higher incidence of liver injury in dengue fever, indicating its potential as an early predictive marker for hepatic involvement. Further studies with larger sample sizes are warranted to validate these findings and to elucidate the underlying pathophysiological mechanisms

Keywords: Dengue fever, DENV, disease, CRP, Liver injury

1. INTRODUCTION

Dengue fever, a mosquito-borne viral illness caused by the Dengue virus (DENV), is a major endemic and epidemic concern in tropical and subtropical regions, including India. The disease presents with a spectrum of manifestations ranging from mild febrile illness to severe dengue with complications such as plasma leakage, hemorrhage, and organ dysfunction. Among these complications, liver injury is commonly observed and can contribute to morbidity. Elevated AST and ALT levels are indicators of liver involvement and may reflect the severity of the disease.

C-reactive protein (CRP), an acute-phase reactant synthesized by the liver in response to inflammation, has been widely studied as a prognostic marker in infectious diseases. CRP levels increase in response to cytokine release, particularly interleukin-6 (IL-6), during systemic inflammation. Previous studies have suggested an association between CRP levels and disease severity in dengue fever. However, limited research has been conducted to establish a correlation between CRP and liver injury in dengue patients.

This study aims to determine whether elevated CRP levels can predict liver injury in dengue fever by correlating CRP-reactivity with AST and ALT elevations. The findings may help in early risk stratification and management of dengue patients with potential hepatic involvement.

pharmaceutics. Nanoparticulate systems such as liposomes were described for the first time in the 1960s by Bangham *et al.*

2. METHODOLOGY

This prospective study was conducted at a tertiary care center in India. Patients with confirmed dengue fever (IgM or NS1-positive by ELISA) were enrolled. CRP and liver function tests (AST and ALT) were performed for all cases. Liver injury was defined as AST and ALT levels exceeding 49 U/L. The study included a total of 25 patients who were categorized into CRP-reactive and CRP-non-reactive groups. The correlation between CRP levels and liver injury was analyzed using descriptive statistics.

3. RESULTS

Among the 25 dengue fever patients included in the study, 12 were CRP-reactive, while 13 were CRP-non-reactive. Liver injury, defined as AST and ALT levels above 49 U/L, was detected in 9 patients (36%). A significant proportion of CRP-reactive patients (7 out of 12, 58.3%) exhibited elevated AST/ALT levels, whereas only 2 of the 13 (15.4%) CRP-non-reactive patients had liver injury.

Gender distribution revealed 14 male and 11 female patients. Among male patients, 5 out of 14 (35.7%) had elevated AST/ALT, while 4 out of 11 (36.4%) female patients had liver injury.

These findings suggest a potential correlation between CRP reactivity and liver involvement in dengue fever. The higher proportion of liver injury among CRP-reactive patients indicates that CRP may serve as an early marker of hepatic complications in dengue fever.

4. DISCUSSION

Liver involvement in dengue fever is a well-documented but often underappreciated complication. The hepatotropic nature of the Dengue virus, coupled with immune-mediated inflammatory responses, contributes to liver dysfunction. AST and ALT elevations are common in dengue, often attributed to direct viral cytopathic effects, hypoxia-induced injury, or systemic immune activation.

The present study found that CRP-reactive patients had a significantly higher incidence of liver injury (58.3%) compared to CRP-non-reactive patients (15.4%). This aligns with previous findings suggesting that elevated CRP reflects a heightened inflammatory response in severe dengue cases. CRP, primarily produced by hepatocytes, is an acute-phase reactant whose levels increase in response to cytokine stimulation. Elevated CRP in dengue fever may indicate an intense systemic inflammatory response, which could contribute to hepatic involvement.

The results also showed that liver injury was nearly equal among male and female patients. This suggests that gender may not be a significant determinant of dengue-associated hepatic dysfunction. However, the small sample size limits the generalizability of these findings.

The correlation between CRP levels and liver injury has important clinical implications. CRP, being a readily available and cost-effective biomarker, could serve as an early predictor of hepatic involvement in dengue patients. This could facilitate risk stratification and timely intervention, thereby improving patient outcomes. Larger, multicentric studies are needed to validate these findings and elucidate the precise role of CRP in dengue-associated liver injury.

5. CONCLUSION

This prospective study found a significant correlation between CRP reactivity and liver injury in dengue fever. Patients with CRP-reactive status had a higher incidence of elevated AST and ALT levels, indicating a possible predictive role of CRP in dengue-associated hepatic dysfunction. Given its accessibility and cost-effectiveness, CRP could be a useful early marker for identifying patients at risk of liver involvement.

However, the study is limited by its small sample size, and larger studies are required to confirm these findings. Future research should also explore the mechanistic pathways linking CRP and dengue-induced liver injury. Integrating CRP measurement into routine dengue management protocols could aid in early intervention and improved patient care.

Conflict of Interest: Nil.

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