

## **ASSESSMENT OF SERUM AMINOTRANSFERASE LEVELS AND ITS CORRELATION WITH SEVERITY OF DENGUE FEVER AT TERTIARY CARE HOSPITAL**

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### **ABSTRACT**

**Background:** Along with global pandemic concern dengue has become a major public health concern in India. Dengue is an emerging epidemic disease and several outbreaks among every state of India are being reported from time to time. The prevalence of dengue viral infection has tended to rise globally in recent decades. According to the World Health Organization, about forty percent of the world's population reported that in the current scenario are at risk for encountering dengue viral infection. **Material & Methods:** The present cross-sectional study includes 100 Patients who had dengue IgM antibody positive were enrolled from the outdoor and the ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before the start of the study. Written informed consent was taken from each study participant. **Results:** On the basis of assessment of severity of dengue fever in correlation with serum SGOT levels we found that out of total study participants 27% patients had mild symptoms, 60% patients had moderate symptoms and 13% had severe dengue fever. Among the mild symptomatic patients 9% had normal serum SGOT levels, 9% had less than 3 times elevated (35-120 IU/l) serum SGOT levels, 8% had 3-10 times elevated (121-400 IU/l) serum SGOT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGOT levels. Among the moderate symptomatic patients 18% had normal serum SGOT levels, 22% had less than 3 times elevated (35-120 IU/l) serum SGOT levels, 15% had 3-10 times elevated (121-400 IU/l) serum SGOT levels and 5% had more than 10 times elevated (>400 IU/l) serum SGOT levels. Among the severe dengue fever patients 3% had normal serum SGOT levels, 4% had less than 3 times elevated (35-120 IU/l) serum SGOT levels, 5% had 3-10 times elevated (121-400 IU/l) serum SGOT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGOT levels. However, this difference was statistically non-significant (p value > 0.05). **Conclusion:** We concluded from the present study that liver function deterioration in dengue fever was varied from normal range of biochemical markers to raised liver function markers. Serum SGOT and SGPT elevation were significantly seen in moderate cases of dengue fever than mild and severe cases.

Keywords: Dengue fever, SGOT levels, SGPT levels.

### **INTRODUCTION**

The prevalence of Along with global pandemic concern dengue has become major public health concern in India. Dengue is an emerging epidemic disease and several outbreaks among every state of India is being reported from time to time (1). The prevalence of dengue viral infection has tended to rise globally in the recent decades (2). According to the World Health Organization about forty present of

the world's population reported that in current scenario is at risk for encountering dengue viral infection (3). In India the burden and prevalence of dengue viral infection is increasing as trends reported globally. It is reported that globally more than 2.5 billion of population living in the areas which are endemic for dengue viral infection. Approximately near about 50 million new dengue

infections reported each year with estimated mortality of more than 25000 globally (4).

Mortality is 20 % if patient is left untreated as compared to less 1 % if dengue is diagnosed early and properly treated. (5). World health organization also reported that as the high prevalence of dengue infection seen worldwide it requires immediate action and planning to combat the situation. There were also reported of metastasize of dengue viral infection exponentially breaching the geographical borders (6). The classical signs and symptoms of dengue infections were fever, headache, myalgia and arthralgia sometimes bleeding manifestations and also shock was reported. The exact clinical picture is varying from subject to subject which depends on serotype of dengue virus, immunity status and sub type of dengue fever. Dengue viral infections were classified among dengue fever, undifferentiated fever and dengue hemorrhagic fever and dengue shock syndrome (7).

The etiology behind dengue is reported as vector borne viral diseases which is transferred to humans by the bite of the infected *Aedes* mosquito. It was also reported that the number of dengue vector (*Aedes* mosquito) also increased which is also contributing in the high prevalence of dengue viral infections (8). Due to its high incidence and prevalence rates of dengue viral infections in India, national vector borne diseases control program is initiated for integrated management of vector, surveillance and monitoring and diseases prevention along with treatment (9). The complete clinical profile should be evaluated before the treatment protocol to save the patient's life. Dengue fever affects multiple organ systems namely nervous system, heart and liver, which resulting in encephalitis, myocarditis and hepatitis. Hence, present study was conducted to assess the serum aminotransferase levels and its correlation with severity of dengue fever at tertiary care hospital.

## **MATERIALS & METHODS**

The present cross-sectional study was conducted at department of general medicine of our tertiary care hospital. The study duration was of six months from July 2018 to December 2018. A sample size of 100

was calculated at 95% confidence interval at 5% acceptable margin of error by epi info software version 7.2. Patients who had dengue IgM antibody positive were enrolled from outdoor and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant.

The data were collected by detailed history, general physical and clinical examination from each patient (more than 15 years of age) after taking the written consent. Patients who had typhoid, malarial diseases, scrub typhus or patients with existing liver disease were excluded from the present study. All study participants were subjected for routine blood investigation for complete blood count and liver function test and ELISA for dengue serology. All the data was recorded on Microsoft excel spread sheet and data analysis was done at 5% alpha and 95% confidence interval using SPSS v22 software. Test of significance were applied on collected and organized data and p value less than 0.05 was considered as statistically significant association between study variables.

## **RESULTS**

In present study, we enrolled 100 patients who had dengue IgM antibody positive from outdoor and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant. In the present study males (61%) to female (39%) ratio was 1.56:1. The mean age of patients was  $38 \pm 6.2$  years. There was no patient in the present study who aged less than 15 years of age. Fever was present among all the study participant. Out of total study participants; 36% had vomiting, 16% had hepatomegaly while 6% had shock and 2% had bleeding tendencies.

On the basis of assessment of severity of dengue fever in correlation with serum SGOT levels we found that out of total study participants 27% patients had mild symptoms, 60% patients had moderate symptoms and 13% had severe dengue fever. Among the mild symptomatic patients 9% had normal serum SGOT levels, 9% had less than 3

times elevated (35-120 IU/l) serum SGOT levels, 8% had 3-10 times elevated (121-400 IU/l) serum SGOT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGOT levels. Among the moderate symptomatic patients 18% had normal serum SGOT levels, 22% had less than 3 times elevated (35-120 IU/l) serum SGOT levels, 15% had 3-10 times elevated (121-400 IU/l) serum SGOT levels and 5% had more than 10 times elevated

(>400 IU/l) serum SGOT levels. Among the severe dengue fever patients 3% had normal serum SGOT levels, 4% had less than 3 times elevated (35-120 IU/l) serum SGOT levels, 5% had 3-10 times elevated (121-400 IU/l) serum SGOT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGOT levels. However, this difference was statistically non-significant (p value > 0.05). (Table 1)

**Table No.-1: Distribution of study participants according to SGOT levels and severity of dengue fever.**

SGOT levels	Severity of dengue			P value
	Mild	Moderate	Severe	
Normal	9%	18%	3%	>0.05
Less than 3 times (35-120 IU/l)	9%	22%	4%	
3-10 times (121-400 IU/l)	8%	15%	5%	
More than 10 times (>400 IU/l)	1%	5%	1%	
<b>Total</b>	<b>27%</b>	<b>60%</b>	<b>13%</b>	

**Table No.-2: Distribution of study participants according to SGPT levels and severity of dengue fever.**

SGPT levels	Severity of dengue			P value
	Mild	Moderate	Severe	
Normal	8%	18%	2%	>0.05
Less than 3 times (45-120 IU/l)	10%	21%	5%	
3-10 times (121-400 IU/l)	8%	16%	5%	
More than 10 times (>400 IU/l)	1%	5%	1%	
<b>Total</b>	<b>27%</b>	<b>60%</b>	<b>13%</b>	

On the basis of assessment of severity of dengue fever in correlation with serum SGPT levels we found that out of total study participants 27% patients had mild symptoms, 60% patients had moderate symptoms and 13% had severe dengue fever. Among the mild symptomatic patients 8% had

normal serum SGPT levels, 10% had less than 3 times elevated (45-120 IU/l) serum SGPT levels, 8% had 3-10 times elevated (121-400 IU/l) serum SGPT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGPT levels. Among the moderate symptomatic patients 18% had normal

serum SGPT levels, 21% had less than 3 times elevated (45-120 IU/l) serum SGPT levels, 16% had 3-10 times elevated (121-400 IU/l) serum SGPT levels and 5% had more than 10 times elevated (>400 IU/l) serum SGPT levels. Among the severe dengue fever patients 2% had normal serum SGPT levels, 5% had less than 3 times elevated (45-120 IU/l) serum SGPT levels, 5% had 3-10 times elevated (121-400 IU/l) serum SGPT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGPT levels. However, this difference was statistically non-significant ( $p$  value > 0.05). (Table 2)

## DISCUSSION

In previous studies, it was reported that dengue viral infection has affect the liver and the liver functions. However, liver functions are not deteriorated in the early phases of dengue fever. The etiology behind this deterioration was multifactorial for example direct viral injury or hypoxic injury or immune mediated damage (10). In present study, we enrolled 100 patients who had dengue IgM antibody positive from outdoor and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant. In the present study males (61%) to female (39%) ratio was 1.56:1. The mean age of patients was  $38 \pm 6.2$  years. There was no patient in the present study who aged less than 15 years of age. Fever was present among all the study participant. Out of total study participants; 36% had vomiting, 16% had hepatomegaly while 6% had shock and 2% had bleeding tendencies. Similar results were obtained in a study conducted by Samanta J et al among patients of dengue viral fever and found that effects of dengue virus infection associated with effects on liver function test and histopathological patterns are suggestive of councilman bodies, micro vascular steatosis and liver cell necrosis (11).

On the basis of assessment of severity of dengue fever in correlation with serum SGOT levels we found that out of total study participants 27% patients had mild symptoms, 60% patients had moderate symptoms and 13% had severe dengue fever. Among the mild symptomatic patients 9% had

normal serum SGOT levels, 9% had less than 3 times elevated (35-120 IU/l) serum SGOT levels, 8% had 3-10 times elevated (121-400 IU/l) serum SGOT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGOT levels. Among the moderate symptomatic patients 18% had normal serum SGOT levels, 22% had less than 3 times elevated (35-120 IU/l) serum SGOT levels, 15% had 3-10 times elevated (121-400 IU/l) serum SGOT levels and 5% had more than 10 times elevated (>400 IU/l) serum SGOT levels. Among the severe dengue fever patients 3% had normal serum SGOT levels, 4% had less than 3 times elevated (35-120 IU/l) serum SGOT levels, 5% had 3-10 times elevated (121-400 IU/l) serum SGOT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGOT levels. However, this difference was statistically non-significant ( $p$  value > 0.05). Similar results were obtained in a study conducted by Javed S et al among 200 patients of dengue viral fever. They reported that mean age of study participants was 36.92 years and male to female ratio was 1.23:1. All patients had fever; shock and bleeding were reported in 16 and 4 cases respectively. 130 patients had moderate dengue fever. Raised aminotransferase levels were reported among 65% study participants, out of them approximately 40% participants had moderate dengue fever (12).

On the basis of assessment of severity of dengue fever in correlation with serum SGPT levels we found that out of total study participants 27% patients had mild symptoms, 60% patients had moderate symptoms and 13% had severe dengue fever. Among the mild symptomatic patients 8% had normal serum SGPT levels, 10% had less than 3 times elevated (45-120 IU/l) serum SGPT levels, 8% had 3-10 times elevated (121-400 IU/l) serum SGPT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGPT levels. Among the moderate symptomatic patients 18% had normal serum SGPT levels, 21% had less than 3 times elevated (45-120 IU/l) serum SGPT levels, 16% had 3-10 times elevated (121-400 IU/l) serum SGPT levels and 5% had more than 10 times elevated (>400 IU/l) serum SGPT levels. Among the severe dengue fever patients 2% had normal serum SGPT

levels, 5% had less than 3 times elevated (45-120 IU/l) serum SGPT levels, 5% had 3-10 times elevated (121-400 IU/l) serum SGPT levels and 1% had more than 10 times elevated (>400 IU/l) serum SGPT levels. However, this difference was statistically non-significant (p value > 0.05). Similar results were obtained in a study conducted by Parkash et al among patients of dengue viral fever and found that 5% patients had serum bilirubin levels raised more than two folds than normal (13). Similar results were obtained in a study conducted by Rajoo Singh Chhina et al among patients of dengue viral fever and found that 30% patients had serum alkaline phosphatase levels raised than normal (14).

## CONCLUSION

We concluded from the present study that liver function deterioration in dengue fever was varied from normal range of biochemical markers to raised liver function markers. Serum SGOT and SGPT elevation were significantly seen in moderate cases of dengue fever than mild and severe cases. However, this difference was statistically non-significant (p value > 0.05).

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