



CORRELATION OF HEPATIC TRANSAMINASES AND THROMBOCYTOPENIA WITH SEVERITY OF DENGUE INFECTION IN TERTIARY CARE HOSPITAL, ELURU

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ABSTRACT **BACKGROUND:** Dengue virus infection is a major and important public health problem in many South East Asian countries¹ and also in more than 100 countries of tropical and subtropical region. Two-fifths of the world's population or 2500 million people are now at risk for dengue, and every year approximately 50 million new cases occur worldwide. Dengue is the most common arboviral disease transmitted globally, is caused by four anti genetically distinct dengue virus serotypes (DEN 1, DEN 2, DEN 3 and DEN 4).⁴ Recently an increasing trend of outbreaks of dengue infections and its severe forms have been reported in India.⁴

OBJECTIVES:

1. To study hepatic enzymes status and thrombocytopenia in patients with dengue infection
2. To correlate hepatic enzymes, thrombocytopenia with severity of dengue fever

MATERIALS AND METHODS

Study design: prospective study

Methodology: the present study was conducted in department of pediatrics ASRAM medical college during study period from October 2016 to August 2018

Enrollment of cases: All clinically suspected cases of dengue infection aged between 2 months to 18 years 50 pediatric cases of dengue WHO satisfied inclusion criteria were included during the study period

RESULTS: Mean age was 8.62±4.30 years, ranging from 1 to 18 years. 62% were male children and 38% were female children. Most of the male children (45.2%) were in 11-15 years age group. Most of the female children (63.2%) were in 6- 10 years age group.

- These 50 cases were grouped into probable dengue, dengue with warning signs and severe dengue as per the W.H.O guidelines.
- Hepatomegaly was seen in 4.31% cases of probable dengue, 39.1% of dengue without warning signs and 75.0% of severe dengue cases.
- Elevated SGOT levels were observed in 78.3% dengue cases, 82.6% in dengue with warning signs cases and all severe dengue cases. This shows that as severity of dengue increases, SGOT levels increases
- Elevated SGPT levels were observed in 39.1% probable dengue cases, 60.9% dengue with warning signs cases and all severe dengue cases. This shows that as severity of dengue increases, SGPT levels increases.
- It was found that elevated liver enzymes were seen more frequently in severe dengue followed by dengue with warning signs and probable dengue patients.
- It was found that thrombocytopenia was present in 100% of severe dengue, 87% on dengue with warning signs, 52.2% of dengue without warning signs.
- As the severity of dengue infection increases, the platelet counts decreases
- Mean platelet counts were decreasing as severity of dengue is increasing. The difference was found statistically significant
- Mean SGOT, SGPT levels were increasing as severity of dengue infection is increasing. This difference was found statistically significant.

CONCLUSION: In dengue infections the degree of liver dysfunction varies from mild injury with elevation of transaminase levels, hepatomegaly to severe injury with jaundice and fulminate hepatic failure. In the present study, elevated SGOT levels were observed in 82.0% cases, elevated SGPT levels were observed in 54.0% cases, and also there is a significant raise in the levels of both the enzymes as the severity of dengue infection increases. As the severity of dengue increases the platelet count decreases. No significant correlation was observed between elevation of hepatic transaminases and thrombocytopenia as the severity of dengue illness increases.

KEYWORDS : Dengue, Thrombocytopenia, Hepatic Transaminases, Serotypes, Outbreaks

INTRODUCTION

Dengue virus infection is a major and important public health problem in many South East Asian countries¹ and also in more than 100 countries of tropical and subtropical region. Two-fifths of the world's population or 2500 million people are now at risk for dengue, and every year approximately 50 million new cases occur worldwide. Dengue is the most common arboviral disease transmitted globally, is caused by four anti genetically distinct dengue virus serotypes (DEN 1, DEN 2, DEN 3 and DEN 4).⁴ Recently an increasing trend of outbreaks of dengue infections and its severe forms have been reported in India.⁴

Hepatic injury with dengue infection has been described since 1967. The degree of liver dysfunction in children with dengue infections varies from mild injury with elevation of transaminase activity, hepatomegaly (tender/non tender) to severe injury with jaundice and fulminant hepatic failure³. The elevation of liver enzymes varies according to the type of clinical presentation of dengue infection, and is more common in patients with severe dengue.

Thrombocytopenia has always been one of the criteria used by WHO guidelines as a potential indicator of clinical severity. Awareness of these manifestations of hepatic involvement and thrombocytopenia in dengue may be helpful in arriving at early diagnosis and avoiding morbidity and mortality.

Since our hospital (ASRAM) is tertiary care hospital, we do see a lot of children with dengue infections including those with atypical manifestations. So, an attempt has been made to study hepatic enzymes status and thrombocytopenia its prognostic significance in children with dengue virus infection.

MATERIALS AND METHODS

Study design: prospective study

Methodology: the present study will be conducted in department of pediatrics ASRAM medical college during study period from October 2016 to August 2018

Enrollment of cases: all clinically suspected cases of dengue infection aged between 2 months to 18 years

INCLUSION CRITERIA:

- Cases positive for dengue NS1, IgG, IgM,
- All children of age between 2months to 18years of age with clinical features suggestive of dengue infection admitted as in patient and out patients in pediatric department

EXCLUSION CRITERIA:

Patients with any identified specific infection like malaria, typhoid, UTI 50 pediatric cases of dengue WHO satisfied inclusion criteria were included during the study period

RESULTS:

ELEVATED SGOT IN COMPARISON WITH TYPE OF DENGUE

			SGOT ELEVATED		Total
			No	Yes	
Dengue	Probable Dengue	Count	5	18	23
		%	21.7%	78.3%	100.0%
	Dengue With Warning Signs	Count	4	19	23
		%	17.4%	82.6%	100.0%
	Severe Dengue	Count	0	4	4
		%	0.0%	100.0%	100.0%
Total		Count	9	41	50
		%	18.0%	82.0%	100.0%

Chi square = 1.102, P value = 0.576 (NS)

Elevated SGOT levels were observed in 78.3% probable dengue cases, 82.6% dengue with warning signs cases and all 100% severe dengue cases. This shows that as severity of dengue increases, SGOT levels increases

DENGUE SGOT LEVELS :

			SGOT GROUP					Total
			0-40	41-200	201-400	401-600	>600	
Dengue	Probable Dengue	Count	5	14	4	0	0	23
		%	21.7%	60.9%	17.4%	0.0%	60.9%	0.0%
	Dengue With Warning Signs	Count	4	14	3	1	14	1
		%	17.4%	60.9%	13.0%	4.3%	60.9%	4.3%
	Severe Dengue	Count	0	0	1	2	0	1
		%	0.0%	0.0%	25.0%	50.0%	0.0%	25.0%
Total		Count	9	28	8	3	28	2
		%	18.0%	56%	16.0%	6.0%	56.0%	4.0%

Chi square = 23.422, P value = 0.003 (S)

ELEVATED SGPT IN COMPARISON WITH TYPE OF DENGUE:

			SGPT ELEVATED		Total
			No	Yes	
Dengue	Probable Dengue	Count	14	9	23
		%	60.9%	39.1%	100.0%
	Dengue With Warning Signs	Count	9	14	23
		%	39.1%	60.9%	100.0%
	Severe Dengue	Count	0	4	4
		%	0.0%	100.0%	100.0%
Total		Count	23	27	50
		%	46.0%	54.0%	100.0%

Chi square = 5.892, P value = 0.053 (NS)

Elevated SGPT levels were observed in 39.1% probable dengue cases, 60.9% dengue with warning signs cases and all 100% severe dengue

cases. This shows that as severity of dengue increases, SGPT levels increases

DENGUE - SGPT LEVELS:

			SGPT GROUP					Total
			0-40	41-200	201-400	401-600	>600	
Dengue	Probable Dengue	Count	12	11	0	0	0	23
		%	52.2%	47.8%	0.0%	0.0%	0.0%	100.0%
	Dengue With Warning Signs	Count	6	14	1	1	1	23
		%	26.1%	60.9%	4.3%	4.3%	4.3%	100.0%
	Severe Dengue	Count	0	2	2	0	0	4
		%	0.0%	50.0%	50.0%	0.0%	0.0%	100.0%
Total		Count	18	27	3	1	1	50
		%	36.0%	54.0%	6.0%	2.0%	2.0%	100.0%

Chi square = 20.853, P value = 0.008 (S)

Elevated SGPT levels are observed as the severity of dengue illness increase.

THROMBOCYTOPENIA AT ADMISSION IN COMPARISON WITH TYPE OF DENGUE:

			Thrombocytopenia		Total
			No	Yes	
Dengue	Probable Dengue	Count	11	12	23
		%	47.8%	52.2%	100.0%
	Dengue with Warning signs	Count	3	20	23
		%	13.0%	87.0%	100.0%
	Severe Dengue	Count	0	4	4
		%	0.0%	100.0%	100.0%
Total		Count	14	36	50
		%	28.0%	72.0%	100.0%

Chi square = 8.592, P value = 0.014 (S)

Thrombocytopenia at admission was observed in 52.2% probable dengue cases, 87% dengue with warning signs cases and all 100% severe dengue cases. This shows that as severity of dengue increases, platelet counts decreases.

ELEVATED SGOT IN COMPARISON WITH THROMBOCYTOPENIA AT ADMISSION:

			SGOT ELEVATED		Total
			No	Yes	
Thrombocytopenia	No	Count	3	11	14
		%	21.4%	78.6%	100.0%
	Yes	Count	6	30	36
		%	16.7%	83.3%	100.0%
Total		Count	9	41	50
		%	18.0%	82.0%	100.0%

Chi square = 0.155, P value = 0.694 (NS)

Elevated SGOT levels was observed in 83.3% cases having thrombocytopenia at admission.

ELEVATED SGPT IN COMPARISON WITH THROMBOCYTOPENIA AT ADMISSION:

			SGPT ELEVATED		Total
			No	Yes	
Thrombocytopenia	No	Count	9	5	14
		%	64.3%	35.7%	100.0%
	Yes	Count	14	22	36
		%	38.9%	61.1%	100.0%
Total		Count	23	27	50
		%	46.0%	54.0%	100.0%

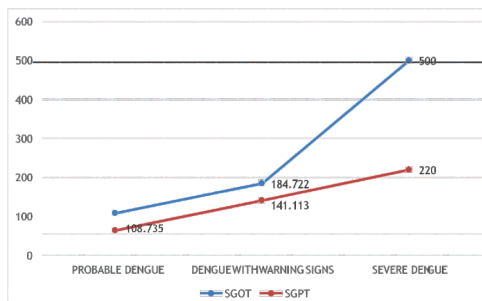
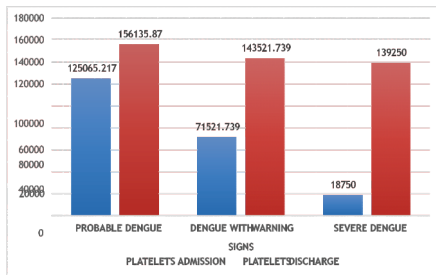
Chi square = 2.617, P value = 0.106 (NS)

Elevated SGPT levels were observed in 61.1% cases having thrombocytopenia at admission.

COMPARISON OF PLATELETS, SGOT, SGPT WITH DENGUE SEVERITY:

Platelets Admission	Mean	Std. Deviation	Minimum	Maximum	P Value
Probable Dengue	125065.217	82065.4263	26000.0	419000.0	0.003 (S)
Dengue With Warning Signs	71521.739	46849.7303	20000.0	230000.0	
Severe Dengue	18750.000	2500.0000	15000.0	20000.0	
Total	91930.000	71816.6607	15000.0	419000.0	
Platelets Discharge	Mean	Std. Deviation	Minimum	Maximum	P Value
Probable Dengue	156135.870	63613.5674	95000.0	320000.0	0.706(NS)
Dengue With Warning Signs	143521.739	49070.3295	90000.0	300000.0	
Severe Dengue	139250.000	53049.5052	98000.0	210000.0	
Total	148982.500	55821.3715	90000.0	320000.0	
SGOT	Mean	Std. Deviation	Minimum	Maximum	P Value
Probable Dengue	108.735	78.7773	30.0	301.8	0.001 (S)
Dengue With Warning Signs	184.722	165.0135	30.0	750.0	
Severe Dengue	500.000	163.2993	300.0	700.0	
Total	174.990	165.4459	30.0	750.0	
SGPT	Mean	Std. Deviation	Minimum	Maximum	P Value
Probable Dengue	64.243	48.4634	11.0	182.0	0.021 (S)
Dengue With Warning Signs	141.113	162.4249	14.0	743.0	
Severe Dengue	220.000	104.5626	80.0	300.0	
Total	112.064	126.4490	11.0	743.0	

Fig 21: COMPARISON OF PLATELETS, SGOT, SGPT WITH DENGUE SEVERITY



As shown in the above table, mean platelet counts were decreasing as severity of dengue is increasing. This difference was found to be statistically significant on ANOVA test. Mean SGOT and SGPT levels were increasing as severity of dengue is increasing. This difference was found to be statistically significant on ANOVA test.

DISCUSSION

HEPATIC INVOLVEMENT IN DENGUE INFECTION

Hepatic involvement due to dengue infection is not uncommon and has been described since 1970. Hepatic dysfunction is a well recognized feature of dengue infections and varying degree of dengue hepatitis is seen.

LIVER ENZYMES Mildly elevated liver enzymes have been reported in dengue infection. Dengue infection leads to liver parenchyma involvement which releases these markers into the blood. The significance of elevated liver enzymes in dengue infection is that it is an early marker of dengue infection. It can also be used as a predictor for assessing the disease severity and higher the levels of liver enzymes poorer is the prognosis of the disease.

Most of the studies showed that unlike other viral infections, in dengue the rise of SGOT is usually more than SGPT and is believed to be due to release from the damaged myocytes. In view of this biochemical pattern, it is possible to confuse liver involvement in dengue infection with typical acute viral hepatitis, especially in countries where outbreaks of hepatitis A and E are common. However, the presence of thrombocytopenia and persistence of fever with elevated hepatic enzymes should help to make a diagnosis of dengue infection. Serological tests for infection dengue virus will help in confirming the etiology of liver injury.

COMPARISSION OF SGOT AND SGPT AND PLATELETS:

SURANGRANT PONGPAN et al		PRSBANAT HI et al	PRESENT STUDY	
SGOT	DF	84.2±2.4	94.1±70.1	108.735±78.7
	DHF	158.1±2.4	106.2±51	184.7±165.01
	DSS	219.4±3.7	238.1±18.3	500.00±163.2
	P VALUE	<0.001	0.0001	0.001
SGPT	DF	42.1±2.3	53.3±26.2	64.2±48.4
	DHF	60.6±2.4	65.3±37.4	141.11±162.42
	DSS	78.7±3.7	193.8±100.1	220.0±104.56
	P VALUE	0.005	0.0001	0.021
PLATELETS	DF	1060843.3±18	130694.4±62581	125065±82065.42
	DHF	62533.8±2.2	1020471±66213.1	71521.739±46849.7303
	DSS	3607±2.3	31250±9799.1	18750.0±2500.00
	P VALUE	<0.001	0.001	0.003

In above studies platelet count decreased rapidly as severity of dengue infection increase. Platelet count <1lakh is associated with increased severity. All studies had significant p value. Elevated liver enzymes (SGOT, SGPT) are known as prognostic factors for DSS SGOT is more elevated than SGPT. Liver enzymes are elevated as the severity of dengue infection increase, had significant p value. Similar results were observed in present study, with elevated transaminases and decreased platelet counts with severity of dengue infection.

CONCLUSION:

In dengue infections the degree of liver dysfunction varies from mild injury with elevation of transaminase levels, hepatomegaly to severe injury with jaundice and fulminate hepatic failure. In the present study, elevated SGOT levels were observed in 82.0% cases, elevated SGPT levels were observed in 54.0% cases, and also there is a significant raise in the levels of both the enzymes as the severity of dengue infection increases. As the severity of dengue increases the platelet count decreases. No significant correlation was observed between elevation of hepatic transaminases and thrombocytopenia as the severity of dengue illness increases.

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