



## Study of Liver Enzymes in Preeclampsia

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### Abstract

**Background-** Preeclampsia is a multisystem disorder which occurs only in pregnant females during 2<sup>nd</sup> and 3<sup>rd</sup> trimesters of pregnancy. It is hazardous for both mother and foetus if not diagnosed early.

**Methods-** The study included 50 preeclamptic patients and 50 normal healthy subjects in the third trimester with normal blood pressure and no complications. The aim of the study was to compare the liver function enzymes in pre-eclampsia with normal pregnancy

**Results-** Serum SGOT, SGPT and serum alkaline phosphatase (SAP) were done and compared. Of these only SAP showed a significant elevation in preeclamptic patients while the other two showed only a mild elevation.

**Conclusion-** Present study was undertaken to assess liver enzymes in preeclampsia. Early detection and accurate diagnosis are essential for correct management.

**Keywords:** preeclampsia, SGOT, SGPT, SAP.

### Introduction

Preeclampsia is associated with hypertension and proteinuria and has the highest maternal and foetal morbidity and mortality of all pregnancy complications. It is exclusively seen in humans<sup>1</sup>. The minimum criteria for the diagnosis of preeclampsia are hypertension (BP $\geq$ 140/90mm Hg after 20 weeks of gestation) and minimal proteinuria. The diagnosis is questionable if proteinuria is absent. The more severe the hypertension or proteinuria, the more certain is the diagnosis of preeclampsia<sup>2</sup>.

Eclampsia is defined as the occurrence of one or more convulsions in a woman with preeclampsia

that cannot be attributed to other causes<sup>2</sup>. In general eclampsia is preventable if preeclampsia is timely diagnosed and properly managed. HELLP syndrome is a life-threatening pregnancy complication usually considered to be a variant of preeclampsia. **HELLP** syndrome was named by Dr. Louis Weinstein in 1982 after its characteristics:

**H** (hemolysis, which is the breaking down of red blood cells)

**EL** (elevated liver enzymes)

**LP** (low platelet count).

In spite of its importance for public health the etiology of this disorder is unknown. Nutritional,

environmental, immunological, inflammatory and genetic factors play a role in the maternal systemic reaction that produces the clinical signs and symptoms of the disorder<sup>3</sup>. Although the pathophysiology of preeclampsia remains undefined, placental ischemia is widely cited as the key factor<sup>4-9</sup>. Prevalence of abnormal liver function tests in pregnancy complicated by preeclampsia varies from 20 -30 %<sup>10,11</sup>.

Mechanism of raised liver enzymes is hypervascularisation and vasoconstriction of liver leading to cell injury, alteration of membrane permeability and damage to hepatocytes<sup>12,13</sup>. The present study was done to monitor changes in liver enzymes in preeclampsia in comparison to normal pregnancy.

### Materials and Methods

The present study was conducted in the Department of Biochemistry in collaboration with the Department of Obstetrics and Gynecology, Government medical college, Thiruvananthapuram. The study was approved by Institutional Ethical Committee. A written, informed consent was obtained from all the participants. There were two study groups of 50 subjects each. One was the control group which included pregnant ladies in the third trimester with normal blood pressure and no complications.

Second group included pre-eclamptic patients in the third trimester. Women having multiple pregnancy, gestational diabetes, obesity, past history of hypertension, diabetes, renal disease and liver disease were excluded from the study. Blood samples were collected and SGOT, SGPT and SAP were estimated by standard methods<sup>14,15,16</sup>.

### Results

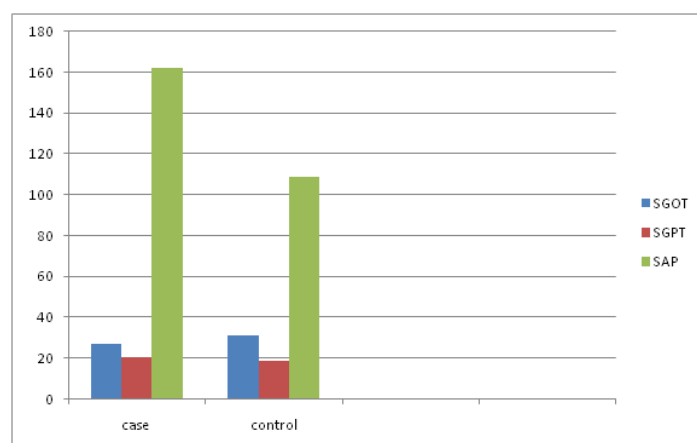
The mean value of SGOT in the study group is 26.44 IU/L and in the control group is 30.72 IU/L. The difference in values between these two groups is statistically insignificant (p value 0.057). The mean value of SGPT in the study group is 20.48IU/L and in control group is 18.18 IU/L. The

elevation of SGPT in the study group is found to be statistically insignificant (p value 0.099). The mean value of SAP in the study group is 162.32 IU/L and in the control group is 108.90. The elevation in the study group is statistically significant (p value 0.000).

**Table 1.** Comparison of liver enzymes in healthy controls and cases of pre-eclampsia

Parameter		Control	Case
SGOT	Mean	30.72	26.44
	SD	9.833	12.238
	P value		0.057
SGPT	Mean	18.18	20.48
	SD	4.902	8.438
	P value		0.099
SAP	Mean	108.90	162.34
	SD	33.722	65.514
	P value		0.000

**Fig 1.** Liver enzyme levels (IU/L) in cases and controls



### Discussion

Preeclampsia is associated with significant morbidity and mortality for mother and baby but it resolves completely postpartum. In preeclampsia hypervascularization & vasoconstriction of liver leads to liver cell injury and alteration of cell membrane permeability. Damage to the cell allows intracellular enzyme to leak into the blood leading to elevated liver enzymes like SGOT, SGPT and SAP.

Many earlier studies have reported increased levels of transaminases in preeclampsia<sup>(17,18,19)</sup>. Women with PET(preeclampsia with toxemia)

and eclampsia with abnormal liver function have chance of greater proteinuria and more maternal complications than those with normal liver function<sup>13</sup>. The maternal symptoms may be vague and easily mistaken for a variety of medical or obstetric complications which should be excluded.<sup>(20,21)</sup> Early detection and accurate diagnosis are essential for correct management.

### Conclusion

Estimation of liver enzymes may be clinically beneficial in the management of preeclampsia. The importance of liver enzymes is furthermore emphasized, especially in patients with thrombocytopenia to detect HELLP syndrome. Further well designed studies may be done to study the prognosis of preeclamptic patients with abnormal liver function.

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