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## Mohini Nainani

Associate Professor, Department of  
Obstetrics and gynecology, Pacific  
Institute of Medical Science and  
Medical College, Umada, Udaipur,  
Rajasthan, India

## Ajay Kumar Bhargava

Professor, Department of  
Biochemistry, Jhalawar Medical  
College, Jhalawar Rajasthan, India

## Correspondence

### Mohini Nainani

Associate Professor, Department of  
Obstetrics and Gynecology, Pacific  
Institute of Medical Science and  
Medical College, Umada, Udaipur,  
Rajasthan, India

## A comparison of liver enzymes, bilirubin and uric acid in preeclampsia, eclampsia and normotensive subjects

Mohini Nainani and Ajay Kumar Bhargava

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### Abstract

**Introduction:** Liver enzymes (AST, ALT, ALP), Bilirubin and uric acid is important biochemical parameters in diagnosis and prognosis of preeclampsia, eclampsia. Present was an attempt to analysed three biochemical parameters of patients and compared with normal pregnant women with normal pregnancy.

**Materials and Methods:** Two hundred subjects were studied among 100 (pregnant women) of preeclampsia and eclampsia and 100 of without complicated pregnancy respectively. Serum AST, ALT, ALP, bilirubin and uric acid determined by commercial kit method. Ethical permission were taken from institution ethical committee.

**Results:** Level of AST, ALT, and ALP were found to be significant in our study when compared with control subjects. Bilirubin and uric acid were insignificant.

**Conclusion:** Present study demonstrates that levels of AST, ALT, and ALP impairment found to be in preeclampsia, eclampsia patients as compared to normal pregnant women.

**Keywords:** preeclampsia, eclampsia, liver enzymes, bilirubin, uric acid

### Introduction

Pregnancy induced hypertension (preeclampsia and eclampsia) play important role in maternal mortality and morbidity and causes approx. 2.8% complication. Subjects all over world in preeclampsia, eclampsia they causes of hypertension in pregnant women [1]. However severity of disease results 50000-100000 mortality annually worldwide and major health issue of both maternal and neonate [2].

Determination of liver enzymes such as aspartate transferase(AST), alanine transferase(ALT), alkaline phosphatase(ALP) and other parameters such as bilirubin, uric acid is important in diagnosis and medical management of pre-eclampsia characterized by pregnancy induced hypertension with other complication (oedema, proteinuria, convulsion) [3].

Eclampsia and pre-eclampsia are pregnancy induced hypertension diseases and may be occur mostly 3<sup>rd</sup> or 2<sup>nd</sup> trimester of pregnancy and may be maternal and fetal morbidity and mortality if untreated [4]. Liver damage have been reported in both pre-eclampsia and eclampsia in literature [5, 6, 7].

In present study we determined level of liver enzymes with other parameter in eclampsia and pre-eclampsia patients and compared with normal pregnancy subjects.

### Material and Methods

The present study was conducted on subjects to coming OPD and IPD of department of Obstetrics and gynaecology SRG Hospital and Jhalawar Medical College, Jhalawar (Rajasthan). Ethical permission have been taken from ethical committee for present study.

### Inclusion criteria

Age group between 19 to 39 years preeclampsia, eclampsia subjects and uncomplicated pregnant women as control were included in the study.

### Exclusion criteria

Pregnant women age group below 19 years and above 36 years and having multiple pregnancy, obesity gestational diabetes, liver disorders, renal disorders, diabetes and post history of hypertension. We have studied 200 subjects with pre-eclampsia and eclampsia, divided into two groups. 100 patients of complicated pregnancy with preeclampsia and eclampsia and 100

pregnant women with uncomplicated pregnancy. Clinical history of study were noted on self-constructed questionnaire and women suffering from diabetes, multiple pregnancy, kidney disease, liver disease and cancer excluded from present study. Determination of liver enzymes such as SGOT (AST), SGPT (ALT) and alkaline phosphatase (ALP) and other parameters bilirubin, uric acid was done in department Of biochemistry by commercial kit method. Results were statistically evaluated by using SPSS version 20.0.

## Results

In present study patients with preeclampsia 39 cases and eclampsia 61 cases were included and women with uncomplicated pregnancy 100 cases were taken as control with age between 20 to 45 years. We have estimated liver enzymes SGOT (AST), SGPT (ALT), alkaline phosphatase (ALP) and other parameters bilirubin and uric acid.

**Table 1:** The normal (reference range) level of biochemical parameters

S.No.	Parameters	Range
1	SGOT(AST)	Upto 40 units/l
2	SGPT(ALT)	Upto 40 units/l
3	Alkaline phosphatase (ALP)	Upto 250 units/l
4	Bilirubin	Upto 1.0 mg/dl
5	Uric acid	2.5-6.5 mg/dl

**Table 2:** Mean level of liver enzymes, bilirubin and uric acid in preeclampsia and eclampsia and control subjects.

Parameters	Mean $\pm$ SD patient	Control	+ Value	P/value
SGOT(AST)	38.37 $\pm$ 3.11	20.45 $\pm$ 4.77	17.92	<0.0001*
SGPT(ALT)	36.92 $\pm$ 4.55	27.16 $\pm$ 5.98	11.24	<0.0001*
Alkaline phosphatase	267.62 $\pm$ 10.71	225 $\pm$ 9.75	29.427	<0.0001*
Bilirubin	0.82 $\pm$ 0.92	0.66 $\pm$ 0.77	1.3377	0.1838
Uric acid	5.47 $\pm$ 1.88	4.88 $\pm$ 2.10	2.0933	0.0378

## Discussion

Pre-eclampsia and eclampsia are pregnancy related hypertensive disease and proper lab investigation such as liver function test and other biochemical parameters may helpful in diagnosis and medical management of both maternal and fetal outcome. In present study abnormal level of liver enzymes i.e. SGPT(AST), SGPT (ALT), Alkaline phosphatase (ALP) found to be similar to other reported worker<sup>3</sup> however other workers reported abnormal level of liver enzymes only in 20%-30% patients of pregnancies with pre-eclampsia and eclampsia [5, 8, 9]. Abnormal liver enzymes may results due to alterative of membrane permeability, vasoconstriction and liver damage. In our study among 100 patients SGOT (AST) increased in 10 (5%), SGPT (ALT) in 11 (10.5%), ALP in 55 (25%), bilirubin in any 2 (2%) and uric acid in 3 (1.5%) patients. Our results are similar to reported by other workers [7, 11, 4, 12]. Bilirubin level in liver function test not significant in patients when compared with normal subjects [13]. Uric acid is function as antioxidant<sup>14</sup>. In pre-eclampsia and eclampsia pregnant women uric acid level was found within normal limits and not significant compared with control group. The risk of preeclampsia is 4% in women with their 1<sup>st</sup> and later pregnancy specially and risk rises upto 14.7% is the second pregnancy who had preeclampsia in their 1<sup>st</sup> pregnancy [13]. In our study however increased level of uric acid in preeclampsia is important in pathogenesis of the fetal manifestations and relationship of uric acid in preeclampsia pregnant women is important in mortality and morbidity of disease [9, 16].

## Conclusion

Determination of liver function test i.e. liver enzymes, bilirubin and uric acid in preeclampsia and eclampsia in present study found to be important parameters in haroti region of Rajasthan in management of pregnancy and reduced risk of fetal morbidity and mortality

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