

## Original article

# Liver function status in pre-eclamptic patients

Dr.Md. Ashraf-uz-zaman<sup>1</sup>, Dr.Gulnihar Begum<sup>2</sup>, Dr.Nasreen Sultana Lovely<sup>3</sup>, Prof. Bilquis Ara Begum<sup>4</sup>

### Abstract

**Objectives :** The aim of the study is to evaluate the extent of hepatic impairment in pre-eclampsia and maternal & perinatal outcome in pre-eclamptic cases.

**Methods :** This prospective cross sectional observational study was carried out in the Department of Obstetrics and Gynaecology, MCHTI (Maternal & Child Health Training Institute), Dhaka, from January 2010 to December 2012. Total 100 cases were included in this study.

**Results :** This study found the mean age of the patients was  $27.61 \pm 5.20$  years ranging from 18 to 40 years. 46% impaired liver function in pre-eclamptic mother. Serum Alkaline aminotransferase 46%, Serum Aspartate amino-transferase 44%, Lactate dehydrogenase 46%, Serum bilirubin 6% were increased and fibrinogen, platelet count were decreased. 16% were intrauterine death, 34% were intrauterine growth restriction, 13% were asphyxia, 70% prematurity and 32% were neonatal death. Pre-eclamptic group could contribute to prematurity.

**Conclusion :** Serum ALT, Serum AST, LDH, Serum bilirubin significantly raised in pre-eclampsia and fibrinogen, platelet count significantly decreased in pre-eclamptic cases. Amongst those with pre-eclampsia abnormal liver function tests were associated with lower platelet count and more maternal complications.

**Key words :** Pre-eclampsia, liver function test.

### Introduction :

Pre-eclampsia is a common disorder of pregnancy and a major cause of maternal and perinatal mortality and morbidity<sup>1</sup>. In Bangladesh the maternal mortality ratio is unexpectedly high i.e. 3/1000 live birth<sup>2</sup>.

Pre-eclampsia is a multisystem disorder of unknown etiology characterized by hypertension associated with proteinuria, greater than 0.3 g/L in a 24 hour urine collection after 20th weeks of gestation<sup>3</sup>. The exact cause of preeclampsia is not known. Possible causes include: autoimmune disorders, blood vessel problems, diet and genes<sup>4</sup>. Pregnancy- associated risk factors in pre-eclampsia are chromosomal abnormalities, hydatiform mole, multiple pregnancy, oocyte donation or donor insemination and urinary tract infection<sup>5</sup>.

Maternal- specific risk factors in pre-eclampsia are extremes of age, black race, family history of pre-eclampsia, nulliparity, pre-eclampsia in a previous

pregnancy, diabetes, obesity, chronic hypertension and renal disease<sup>5</sup>. Being a multi-organ disorder, pre-eclampsia affects the brain, kidneys, lungs, liver as well as the uterus of the mother, thereby putting the baby also at risk with decrease liver function and decrease in the blood clotting ability of the body<sup>6</sup>. A confirmed medical diagnosis is made by means of laboratory evidence, such as some of them are increased liver enzymes, low platelet count, increase in plasma creatinine, uric acid and decreased circulating fibrinogen<sup>7</sup>. Alteration of liver function in pre-eclamptic patients are about 10%-15%<sup>7</sup>. It is common in severe pre-eclampsia where S.ALT, S.AST and LDH markedly increased. The elevated liver enzymes are thought to result from damage to liver cells as the consequence of similar events, liver transaminase (AST) levels that help to define the condition have to be greater than 70 U/L, but are often many times higher than this (sometimes in the 1000's U/mL range)<sup>8</sup>. It should also be noted that the liver is an extremely vascular organ, and if significant damage occurs, intrahepatic hemorrhage, subcapsular hematoma formation, or even hepatic rupture may occur and can be life-threatening events even if recognized early<sup>8</sup>. HELLP syndrome is a severe complication of pre-eclampsia which is characterized by haemolytic anaemia, elevated liver enzymes, low platelet count. The majority of pre-eclamptic patients with hepatic

1. Associate professor, Dept. of Biochemistry, Ad-din women's medical college, Dhaka- 1217.

2. Medical officer (DG-FP).

3. Asst. professor, Dept. of physiology, Ad-din women's medical college, Dhaka -1217.

4. Professor & Head Dept. of Biochemistry, Ad-din women's medical college, Dhaka - 1217.

Correspondence : Dr. Md. Ashraf-uz-zaman  
E-mail : apuzaman@gmail.com

involvement complain of epigastric or right upper quadrant pain several days before the onset of more serious symptom<sup>9</sup>.

Maternal mortality is very high in Bangladesh. Every hour 03 women die due to causes related with pregnancy and child birth. Pre-eclampsia is the third leading pregnancy-related cause of death<sup>5</sup>. The pre-natal mortality rate is also much higher. Lack of antenatal care is one of the predisposing factor. Adequate antenatal care, early diagnosis of pregnancy complication and proper management will reduce the maternal and pre-natal mortality and morbidity from this condition. The global (international) incidence of pre-eclampsia has been estimated at 5-14%<sup>5</sup>.

This study has been designed to detect hepatic involvement in pre-eclamptic patients & to assess maternal & pre-natal outcome of these cases. Aim of this study is to detect extent of hepatic involvement in pre-eclampsia.

### Materials and Methods

This prospective cross sectional observational hospital based study was carried out in the Department of Obstetrics and Gynaecology, MCHTI (Maternal & Child Health Training Institute), Dhaka, from January 2010 to December 2012. Total 100 patients were included in this study. Inclusion criteria were: patients with pre-eclampsia characterized by BP 140/90 mmHg or more and significant proteinuria after 20 weeks of pregnancy. Exclusion criteria are: Pre-eclampsia patients having history of hepatitis, cirrhosis of liver, gallstones & medical disorders that altered liver function.

### Results

**Table I :** Age distribution of the patients

Age in years	Frequency	Percent (%)	Mean±SD
< 20	2	2	27.61±5.20
20-25	29	29	
26-30	48	48	
31-35	11	11	
36-40	10	10	
Total	100	100.0	

**Table II :** Liver function in pre-eclamptic mother

Liver function test	Frequency	Percent (%)
<b>Liver function</b>		
Normal	54	54
Impaired	46	46
<b>Serum Alkaline aminotransferase</b>		
Normal	54	54
High	46	46
<b>Serum Aspartate aminotransferase</b>		
Normal	56	56
High	44	44
<b>Lactate dehydrogenase</b>		
Normal	54	54
High	46	46
<b>Serum Bilirubin</b>		
Normal	94	94
High	6	6
<b>Platelet count</b>		
Normal	88	88
Low	12	12
<b>Fibrinogen</b>		
Normal	90	90
Low	10	10

**Table III:** Prenatal complication

Prenatal complication	Frequency	Percent (%)
Intrauterine death	16	16
Intrauterine growth restriction	34	34
Asphyxia	13	13
Prematurity	70	70
Neonatal death	32	32

### Discussion

Pre-eclampsia is a disorder of unknown aetiology. It is a major cause of maternal and perinatal mortality and morbidity worldwide, particularly in developing countries<sup>10</sup>.

This study found the mean age of the patients was  $27.61 \pm 5.20$  years ranging from 18 to 40 years. Maximum (48%) patients were in the age group 26-30 years followed by (29%) 20-25 years (11%) 31-35 years (10%) 36-40 years and lowest in the age group less than 20 years (2%). Sami et al. found 46% in <20 years age group, 6% in 20-30 years, 12% in 30-40 years and 36% in > 40 years<sup>11</sup>. In Another study found that 5.2% in < 20 years, 1.5% in 21-30 years and 1.6% in > 30 years age group.<sup>13</sup> Okafor and Efetie found mean age was 28.4 years (range 17-40 years)<sup>12</sup>.

Regarding liver function this study found 45.33% impaired liver function in pre-eclamptic mother. S.ALT 45.33%, S.AST 44%, S. bilirubin 5.33% were increased and fibrinogen & platelet count were decreased. Girling et al<sup>13</sup>. reported 37% abnormal liver function in pre-eclamptic case which was near to this study. They identified that low platelet count in pre-eclamptic cases.

The identifying complications found in this study were 16% intrauterine death, 34.7% intrauterine growth restriction, 13.3% asphyxia, 70.7% prematurity and 32% neonatal death. Pre-eclamptic group could contribute to prematurity. Prematurity is most of the fatal outcome. Pre-eclampsia is responsible for the occurrence of more than 40% of premature deliveries around the globe<sup>14</sup>.

### Conclusion

This study showed S.ALT, S.AST, LDH, S. bilirubin significantly raised in pre-eclampsia and fibrinogen, platelet count significantly decreased in pre-eclamptic cases. Amongst those with pre-eclampsia abnormal liver function tests were associated with lower platelet count and more maternal complications. So, early diagnosis may be helpful to minimize the subsequent maternal complications.

### Reference

1. GA Dekker, Baha M Sibai, Early detection of pre-eclampsia A M J Obstet Gynaecol. 1991; 165: 460-72.
2. Datta D.C. Text Book of 'Obstetrics. 6th ed. Calcutta. New central book agency (p) Ltd, 2005; 221-233.
3. Datta D. C. Text Book of Obstetrics. 6th ed. Calcutta : New Central book agency (p) Ltd. 2006; 221-231.
4. Pre-eclampsia, Midline Plus, 29 January 2009.
5. Eroglu M, Sayah AJ, Talavera F, Zwanger M. Pregnancy, Preeclampsia, May 2008. [http:// www.medscape.Com / public](http://www.medscape.Com/public)
6. Pre-eclampsia-A Risk Factor During Pregnancy. Health Care Manual Thursday, May 1, 2008.
7. DeCheny AH Nathan L. Current Obstetric & Gynaecologic diagnosis & treat. 9th ed. New York: McGraw-Hill companies 2004; 338-353.
8. Cunningham FG, Leveno KL, Bloom SL, et al. Hypertensive disorders in pregnancy. In: Cunningham FG, Leveno KL, Bloom SL, et al, eds. Williams Obstetrics. 22nd ed. New York, NY; McGraw-Hill; 2005; chap 3
9. James J Walker. Pre-eclampsia, Lancet October 7 2000; 356: 1260-1264.
10. Robertson WB. Brosens I. Dixon G. Maternal uterine vascular lesions in the hypertensive complications of pregnancy. In: Linbheimer MD, Katz AI. Zuspan FP, editors. Hypertension in pregnancy. New York: John Wiley; 1976; 115-29.
11. Sami S, Afridi U, Ehsan N. Magnesium Sulphate as an Anticonvulsant in Management of Eclampsia: A Hospital Based Study. Pak J Med Res 2007; 46(3):30-35.
12. Okafor UV, Efetie RE. Critical care management of eclampsia: challenges in an African setting. Trop Doct. 2008; 38:11-13.
13. Girling JC, Dow E, Smith. Liver function tests in pre-eclampsia: importance of comparison with a reference range derived for normal pregnancy. BJOG 2005; 104(2):246-250.
14. Helewa ME, Burrows RF, Smith J, Williams, Brain P, Rabkin SW. Definitions, evaluation and classification of hypertensive disorders in pregnancy: Report of the Canadian Hypertension Society Consensus Conference: Can Med Assoc. J. 1997; 157 (6): 715-725.