Maternal Outcome in Severe Preeclampsia Patients In Relation To Altered Liver Function Test parameters

Manohar Tankasali, Manjula Patil

Department of OBG, [1]Department of Anatomy, S. N. Medical College, Bagalkot, Karnataka, India.

Abstract

Introduction: Preeclampsia is one of the most common causes of feto-maternal morbidity and mortality in both developed and underdeveloped countries. Severe preeclampsia (SPE) can have catastrophic effects if treatment is delayed. Liver is involved in most of the cases of preeclampsia which manifests initially with alterations in the liver function test (LFT) which can be used as an early indicator of the complications in SPE patients.

Aims and Objectives: To study the maternal outcome in severe preeclampsia patients in relation to LFT**.**

Material and Methods: All women with diastolic pressure >110 mm of Hg were included in the study considering the exclusion criteria. Patient followed up for the maternal outcome.

Results: 48% of total study cases had altered liver function test values. Over all incidence of maternal complications were 31 % and in cases with increased LFT were 50% showing significant difference. Renal parameters were altered in 25% of cases which is the most common complication seen in the study. Other complications were: Altered renal function test - 13%, Abruptio placentae 6%, Postpartum hemorrhage(PPH) 6%, Pulmonary edema 4%, Cardiac complication 3%. Maternal mortality was 2% in overall study group. One case died due to cardiopulmonary complication and another due to Disseminated Intravascular Coagulation(DIC) with cerebro-vascular complication. Both cases had raised LFT showing 4.2% maternal mortality in association with raised LFT.

Conclusion: Detection of increased LFT in cases of SPE is a special risk category, associated with increased rate of maternal complications, compared to SPE with normal LFT. Such cases need special attention with early detection and referral to higher centre with better facilities of ICU, NICU and better laboratory set up to reduce the complications and mortality.

Key Words: Severe Preeclampsia(SPE), Liver Function Test (LFT), Maternal mortality.

Introduction

Preeclampsia (PE) is a disease of multiple organ systems that is unique to pregnancy and is often associated with significant maternal and neonatal morbidity and mortality especially when it is severe and occurs well before term. Severe preeclampsia (SPE) is defined as the presence of one or more of the following criteria: (a) blood pressure (BP) of 160 mmHg or higher systolic or 110 mmHg or higher diastolic on two occasions at least 6 hours apart while the patient is on bed rest; (b) proteinuria of 5 g or higher in a 24-hour urine specimen or 3 + or greater on two random urine samples collected at least 4 hours apart; (c) oliguria of less than 500 mL in 24 hour with other associated signs and symptoms[1]. Liver is involved in at least 10% of women with PE[2-6]. Liver involvement is more common in SPE constituting the primary cause of death in 15-20% of fatal cases[3,7]. Abnormal LFTs occur in 20% to 30% of pregnancies complicated by PE and are associated with poor maternal and fetal outcomes[8,9]. If unrecognized, PE can progress to the syndrome of haemolysis, elevated liver-enzyme level and low platelet count (HELLP) and eclampsia. HELLP syndrome is noted in 5-10% of patients with preeclamptic symptoms. Mortality is 7-35% and perinatal mortality of the child may be up to 40%[10]. In severe pre-eclampsia there are alterations in the hepatic functions and integrity including delayed excretion of bromosulphthalein and elevation of liver enzymes. Abnormal liver function tests occur in 20% to 30% of pregnancies complicated by pre-eclampsia and are associated with poor maternal and fetal outcomes [11,12]. Many authors have studied LFT alterations in Preeclampsia patients [13-16] and have differed opinion regarding the origin of enzymes whether due to liver injury per se [15,17] or extrahepatic due to haemolysis [13,16]. These LFT changes occurs early well before the complications take a worse condition. Many authors have studied LFT alterations in PE patients and have differed opinion regarding the origin of enzymes

Address for correspondence

Dr. Manhor Tankasali, Assistant Professor, Department of OBG

S. Nijalingappa Medical College, Bagalkot-587102.

E-mail:-drmanohartankasali123@gamil.com

whether due to liver injury per se or extrahepatic due to hemolysis[11-14]. These LFT changes occurs early well before the complications take a worse condition. This study was undertaken to know whether these alterations in LFT can be utilized for knowing the complications as early as possible in SPE patients to reduce the maternal morbidity and mortality.

Aim: To study the maternal outcome in severe preeclampsia patients in relation to altered LFT parameters.

Material and methods

The study cases were patients who got admitted for treatment of high BP during pregnancy in S. N. Medical College, Bagalkot during 2009 to 2011. All pregnant women with period of gestation of 28-40 weeks recorded to have diastole BP of 110 mmHg and above were considered in study group applying inclusion and exclusion criteria. All patients with present or recent past history of liver disease, patients on hepatotoxic drugs were excluded.

Results

Table 1. LFT in severe PE in different age group

Age	Raised LFT		Total
	No	Yes	
Below 20	18	14	32
21-25	23	25	48
26-30	9	7	16
31-35	2	2	4
Total	52	48	100

Most of patients were in the age group of 20- 25 years in the total study cases. SPE were more commonly seen in younger age group (< 25Yr) 80%. Among patients with raised LFT also maximum cases were seen in the same age group (81.3%). Mean age group was 22.3 age. (P = 0.879 NS)

Table 2. Parity and LFT in severe PE

PARA	Raised LFT		Total
	No	Yes	
Primi	28	28	56
Multi	24	20	44
Total	52	48	100

In overall study group number of primigravida patients were 56% and multigravida were 44%. In patients with raised LFT primigravida were 58.3% and multigravida were 41.7%. (P = 0.652 NS)

Table 3. Booking status and LFT in SPE

BOOK	Raised LFT		Total
	No	Yes	
Booked	33	17	50
Unbooked	19	31	50
Total	52	48	100

In overall study group, number of booked and unbooked cases were equal. In patients with raised LFT unbooked cases were more (64.6%) showing complications. Statistical significant relation is seen between raised LFT and unbooked cases. (P= 0.005 Significant)

Table 4. Eclampsia and altered LFT in severe PE

DIAGN	Raised LFT		Total
	No	Yes	
SPE	45	32	77
E	7	16	23
Total	52	48	100

Statistical significant relation was seen between raised LFT and number of eclampsia cases. Incidence of eclampsia was seen in 23 cases (23%). In patients with raised LFT, incidence of eclampsia was seen in 16 cases (33.3%). (P = 0.021 Significant).

Table 5. Incidence of HELLP syndrome in altered LFT patients

HELLP	Raised LFT		Total
	No	Yes	
No	53	41	94
Yes	-	6	6
Total	53	47	100

Study showed significant co-relation between the raised LFT and Incidence of HELLP syndrome. Total numbers of HELLP syndrome were 6 in overall study group. It constituted 12.5% of cases of altered LFT cases. (P .009 significant).

Table 6. Maternal morbidity in relation to altered LFT in severe PE

MORBIDITY	Raised LFT		Total
	No	Yes	
Nil	45	24	69
Acute renal failure	2	10	12
Postpartum Hemorrhage	4	2	6
Abruption		5	5
Pulmonary edema	1	3	4
Cardiac complications & Acute renal failure	-	1	1
Cardiac complications & Acute renal failure & DIC	-	1	1
Cardiac complications & Pulmonary edema & DIC	-	1	1
Abruption & Acute renal failure	-	1	1
Total	52	48	100

The study showed significant co-relation between the raised LFT and maternal complications. About 31(31%) cases had complications. Altered renal function was most commonly seen in 13 (13%) of cases. 6 (6%) cases had PPH, 6(6%) had abruption, 4(4%) cases had pulmonary complications, 3(3%) cases had cardiac complications. Similarly among group with raised LFT, 24(50%) cases had complications. Altered renal function was most common seen in 11 (22.1%) of cases. 2 (4.2%) cases had PPH, 6(12.5%) had abruption, 3 (6.3%) cases had pulmonary complications, 3(6.3%) cases had cardiac complications. (P= 0.004 significant).

Table 7. Maternal mortality and LFT in severe PE

Maternal mortality	Raised LFT		Total
	No	Yes	
No	52	45	97
Yes		3	3
Total	52	48	100

Totally there were 2 (2%) cases which had maternal mortality. It constituted 4.2% cases among raised LFT cases. (P= 0.137 NS).

Discussion

Hypertensive disease in pregnancy is a major cause of maternal and fetal morbidity and mortality. Pre-eclampsia(PE) condition is best described as pregnancy specific syndrome of reduced organ perfusion secondary to vasospasm and endothelial activation. PE typically develops after the 20th week of gestation and involves a wide spectrum of clinical signs and symptoms. The cause of PE remains unknown; however, placental dysfunction may initiate the systemic vasospasm, ischemia, and thrombosis that eventually damages maternal organs[18,19]. Liver is involved in at least 10% of women with preeclampsia[2-6]. Abnormal LFTs occur in 20% to 30% of pregnancies complicated by pre-eclampsia and are associated with poor maternal and fetal outcomes [8-9, 14]. In one study[11]ALT and AST were raised mildly in patients with pre-eclampsia compared with corresponding trimester of normal pregnancy and levels were significantly raised in patients with eclampsia. Churchill et al[12] reported that rise in GGT is independent of other biochemical marker of hepatic damage and it indicate systemic release of GGT secondary to endothelial cell destruction within the uteroplacental circulation. Shukla et al[13] LDH increased to 55% in moderate pre-eclampsia, to 73 % in severe pre-eclampsia and to 86% in eclampsia, from under 40% in normal pregnancy. In our study incidence of HELLP syndrome is 7%, partial HELLP 42 cases (Table 5). In that, one patient had only thrombocytopenia, but patient with altered liver enzymes (AST, ALT and LDH) were 48%, which includes cases of complete HELLP syndrome. In our study 48% of cases had altered LFT. Table 1 & 2 shows that the spectrum of PE is more common in extremes of reproductive age

groups. In our study maximum number of SPE were below 25 years (80%) with mean age of 22.3 years and associated with increased LFT were also more common in same age group (81.3%), which correlates with historical data. Both SPE and cases associated with increased LFT were more common in primigravida 56% and 58.3% respectively. Table 3 shows, complications of SPE were more common in patients having inadequate antenatal care(our study), which is also supported by low socio economic status and people coming from under developed areas as compared to other study[18]. In our study 64.6% of increased LFT were of un-booked cases and complications were more common with un-booked cases. Table 5 shows **t**he incidence of HELLP syndrome among women with PE was 12.8% and the incidence among women with eclampsia was 19.8% as reported by Nagoya [18]. In our study 23% of eclampsia seen in study group and in cases of raised LFT 33.6% had eclampsia (P = 0.021 Significant). Maternal morbidity in our study was 31 % cases of study group and in cases with raised LFT 50% had maternal complications (Table 6). Altered renal parameters seen in 13(13%) of total cases, and 11(22.1%) of cases of raised LFT. It was the most common complications seen in the study. It is supported by a study by Cunningham[19] of HELLP syndrome is also reported to be a major cause of renal failure in developing countries found renal compromise in 9.6% of the cases. According to few studies mild renal dysfunction is virtually universal [20-22]. **I**ncidence of postpartum haemorrhage was 6% of total cases and 4.2% of raised LFT. Incidence of abruption was 6% of total cases and 12.4% of cases of raised LFT. Sibai et al[23] observed DIC in 21% and abruptio placenta in 16% of the HELLP cases. In other studies DIC was found in 8 to 21% of patients[20,24,25]. Our study also support these finding showing; thrombocytopenia in 9% of overall cases, and in cases with increased LFT incidence of thrombocytopenia was 18.8% (P = 0.005 highly significant). Abruption was in 6% of overall SEP cases and in cases with raised LFT 12.4%. Incidence of DIC was 4.2 % in cases with raised LFT. Incidence of cardio respiratory complications were 1 % in total study group and 2.1 % in cases of raised LFT. Incidence of pulmonary edema was 4% in total study group and 6.3% of cases of raised LFT.

Maternal Mortality

(P value=0 .004 significant) (Table 7) A study by Isler [26] showed that causes of maternal mortality were cerebral haemorrhage (45%), cardiopulmonary arrest (40%), DIC (39%), Adult respiratory distress syndrome (28%), Renal failure (28%), Sepsis (23%), Hepatic haemorrhage (20%) and Hypoxic ischaemic encephalopathy (16%). In our study Maternal mortality was 2% in overall study group. One case died due cardiopulmonary complication and another due to DIC with cerebro-vascular complication. Both cases had raised LFT showing 4.2% maternal mortality in association with raised LFT.

Conclusion

Study outcome clearly states that in cases of SPE if there is altered LFT then maternal complications are significantly increased which calls for the need of early detection and referral to higher centres with better facilities.

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