MATERNAL AND PERINATAL OUTCOME IN PREECLAMPSIA AND ECLAMPSIA IN RELATION TO LDH LEVELS

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ABSTRACT Lactate Dehydrogenase (LDH) is an intracellular enzyme. Recently LDH has been suggested as potential marker to predict severity of pre-eclampsia. The aim of present study was to correlate LDH levels in pregnant women and women with Preeclampsia and eclampsia in antepartum period and to correlate maternal and perinatal outcomes with LDH levels. Pregnant women in this study were enrolled in 3rd. trimester from 28 weeks onwards. Case control study was done in 100 women with normal B.P and in another 100 women having Pre-eclampsia and Eclampsia. Serum LDH levels were measured in all women and maternal and perinatal outcome was assessed. A significant positive correlation was found in patients with Pre-eclampsia and Eclampsia. LDH levels gradually increased with increase in the severity of the disease. Regular monitoring of serum LDH levels in such patients may help in detecting severity of the disease and associated end organ damage. The maternal complications were found to be maximum in women with LDH > 800 IU/l. Abruptio was the most common complication.

KEYWORDS : Maternal outcome, LDH, Preeclampsia, Perinatal outcome

INTRODUCTION

Preeclampsia is an idiopathic multisystem disorder that complicates 5-8% of all human pregnancies. It is a clinical diagnosis characterized by heterogeneous clinical and laboratory findings. The clinical findings manifest as maternal syndrome or fetal syndrome or both with subsequent increase in the perinatal and maternal morbidity and mortality [1-3]. There is increasing evidence that endothelial cell and altered endothelial cell function play an important role in the pathogenesis of preeclampsia.

The analysis of biochemical markers particularly markers related to vascular dysfunction such as LDH, AST, uric acid may enrich the ability to predict and prevent Pre-eclampsia in the forthcoming pregnancy (4,5). LDH is an intracellular, enzyme found in almost all body tissues. Normal LDH levels vary from 200 - 400 I.U./L and is not affected by pregnancy. When tissues are damaged by pathological process of disease, there is increase in the level of LDH in blood (6).

Pre-eclampsia and Eclampsia become apparent in late stages of pregnancy, usually in third trimester. These are multisystem disorders which affect renal, hepatic, nervous and coagulation system of body, thus leading to cellular death and significantly raised LDH levels.

The present study was intended to assess the prognostic significance of the value of serum LDH as a marker of preeclampsia – eclampsia and its severity. It is strongly associated with foetal growth retardation and prematurity, leading to perinatal mortality and morbidity.

METHOD

This study was conducted on 200 antenatal women attending the Dept. of Obst and Gynae., Jawahar Lal Nehru Medical College and Hospital, Bhagalpur, Bihar. Antenatal women with singleton pregnancy and cephalic presentation, from 28 weeks onwards were enrolled in the study. Detailed history was taken and thorough clinical examination was done. Patients were divided into healthy normotensive patients and patients of Pre-eclampsia and Eclampsia.

Group I : 100 pregnant women with preeclampsia (study group) and were further subdivided into three categories on the basis of LDH levels <600 IU/l, 600-800 IU/l and >800 IU/l

Group II: 100 normotensive pregnant women (control group).

Those with high blood pressure were further divided into mild Pre-Eclampsia, severe Pre-eclampsia and Eclampsia. The participants were followed in OPD and in wards till delivery. LDH levels of both the groups were compared and association of maternal and perinatal outcome was assessed in relation to LDH levels. This study was approved by Institutional ethical committee.

Exclusion Criteria

Patients with chronic hypertension, renal diseases, diabetes, liver

disorders, epilepsy, haemolytic anaemia, trauma, bone fractures, muscle injury and on drugs (aspirin, fluoride, narcotics) were excluded from this study.

RESULT

Maximum number of patients in both the groups were nulliparous and were in the age group of 21-25 years (Table 1). In the study group there were 48 cases of mild preeclampsia (BP=140/90 - 160/110), 42 cases of severe preeclampsia (BP=160/110) and 10 cases of eclampsia. The mean LDH levels were significantly higher in women with preeclampsia as compared to normotensive women (Table 2). Maximum number of patients in control group had spontaneous onset of labour while in patients with preeclampsia and eclampsia induction of labour was done.

Table 1:

Parity	Control (n=100)	Study(n=100)
P ₀	59	63
P ₁	23	25
P ₂	7	8
P ₃	8	3
≥P ₄	3	1

Table 2:

Comparison of blood pressure with LDH levels			
	No. of patients	LDH Range	Mean
Control	100	(100-255)	184
Mild preeclampsia	48	(220-750)	412
Severe preeclampsia	42	(550-1250)	776
Eclampsia	10	(650-1400)	897

Table 3

LDH Range	Mild Preeclampsia	Severe Preeclampsia	ECLAMPSIA
<600	29(60.42%)	15(35.72%)	1(10%)
600-800	13(27.08%)	13(30.95%)	4(40%)
>800	6(12.50%)	14(33.33%)	5(50%)
TOTAL	48	42	10

Table 3 shows the distribution of women with preeclampsia according to LDH levels into mild and severe eclampsia and there was significant increase in number of women with severe preeclampsia with higher LDH levels. Table 4 shows the maternal outcome in women with preeclampsia according to LDH levels. The maternal complications were found to be maximum in women with LDH > 800 IU/l. Abruptio was the most common complication followed by eclampsia. 2 maternal death (8%) was observed in women with LDH levels>800. Eclampsia, HELLP syndrome and rate of transfer to ICU was found to be significantly associated with high LDH levels.

Perinatal outcome and various complications according to LDH levels in the study group are depicted in Table 5. There was fall in Apgar score at 1 minute and 5 minutes with increase in LDH levels and there was significant association with raised LDH levels with low birth weight of the babies, neonatal sepsis and perinatal mortality.

Table 4

Comparison Of Maternal Outcomes With LDH			
LDH Range	<600(n=45)	600-800(n=30)	>800(n=25)
Eclampsia	1(22.22%)	4(13.33%)	5(20%)
Abruptio	7(31.82%)	5(16.67%)	9(36%)
HELLP	0	2(66.67%)	6(24%)
DIC	0	1(33.33%)	2(8%)
ICU Admission	1(22.22%)	3(10%)	4(16%)
Renal Failure	0	1(33.33%)	2(8%)
Mortality	0	0	2(8%)
Total	9	16	30

Table 5

Comparison Of Perinatal Outcomes With LDH			
LDH Range	<600(n=45)	600-800(n=30)	>800(n=25)
Average body weight	2.3kg	2.1 kg	1.9kg
Apgar score <7 at 1 minute	38(84.44%)	23(76.67%)	23(92%)
Apgar score <7 at 5 minute	4(8.89%)	4(13.33%)	7(28%)
LBW	20(44.44%)	17(56.67%)	21(84%)
Premature	15(33.33%)	9(30%)	5(20%)
VLBW	3(6.67%)	4(13.33%)	12(48%)
Neonatal Sepsis	1(2.22%)	3(10%)	6(24%)
NICU Admission	14(31.11%)	13(43.33%)	14(56%)
Perinatal mortality	3(6.67%)	3(10%)	11(44%)

DISCUSSION

To prevent the complications of preeclampsia, the disease must be diagnosed at the earliest. LDH enzyme plays an important role in cellular respiration. Elevated levels of LDH indicate tissue damage and is the main cause of Preeclampsia, abruptio, HELLP Syndrome, acute renal failure and DIC as compared to control group⁷. In this study increased level of LDH was found in patients with preeclampsia and Eclampsia as compared to control group. Qublan et al⁸ found in their study that the mean LDH levels in controls was 299±79 IU/l, in patients with mild preeclampsia was 348±76 IU/l and in severe preeclampsia was 774±69.61 IU/l. This demonstrated that there is significant association of LDH levels with severe preeclampsia.

Present study demonstrated that LDH level <600 IU/l was observed in 60.42% patients of mild preeclampsia and 35.72% patients of severe preeclampsia whereas 12.5% patients with mild preeclampsia and 50% patients with severe preeclampsia had LDH levels >800 IU/l. LDH levels were found to be significantly higher in severe preeclampsia than mild preeclampsia.

The association of mode of delivery with higher LDH levels was not significant in the study done by Qublan et al⁸ and Mary et al. This is in contrary to our present study in which it is found that with increasing LDH values, rate of induction of labour and cesarean delivery increases significantly.

Various maternal complications observed were eclampsia, abruptio, DIC, HELLP syndrome and renal failure. Abruptio followed by eclampsia was the most common complication observed. It was also observed that maximum number of complications were observed in preeclamptic women with LDH levels >800 IU/l and more than one complication was present in one patient. Umasatyasri et al⁹ observed increase in maternal morbidity with increasing serum LDH levels. Martin et al¹⁰ (1999) also found higher level of LDH associated with significant maternal mortality and morbidity.

Present study also showed that there is reduction in birth rate and reduced Apgar score with raised LDH level. In our study with LDH level >800 IU, 92% neonates had low Apgar score at 1 minute, 84% had LBW, 56% had NICU admission and 44% had perinatal mortality. Thus there is an increase in perinatal complication and even perinatal death with increased LDH levels. The mean Apgar score at 1 min and 5 min was found to be less in cases with high LDH levels in Umasatyasri et al⁹ and Jaiswar et al¹¹. Malerewicz et al¹² (2006), also concluded that acute clinical symptoms that endanger fetal life in Preeclampsia correlate well with distinct activity of LDH.

It was observed that maternal and perinatal morbidity and mortality had significant association with increasing LDH levels. It showed that LDH levels have significant correlation with increasing severity of preeclampsia with poorer maternal and perinatal outcome.

CONCLUSION

High serum LDH level is associated with severity of preeclampsia and thus maternal and fetal outcomes in patients of preeclampsia and eclampsia. LDH can be used as prognostic tool from early third trimester to detect and prevent morbidity and mortality in mother as well as in foetus.

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