

Original Research Article

Serum LDH in Preeclampsia & Eclampsia and Maternal Outcomes

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Abstract: The study was undertaken to determine the correlation of serum LDH in preeclampsia and eclampsia and perinatal outcome. This is a hospital based comparative case control study done in Department of Obstetrics & Gynaecology SMS Medical College, Jaipur between March 2014 to Oct 2015 on 140 subjects including normotensive , mild pre eclamptic , severe pre eclamptic and eclamptic pregnant women after 28 weeks of gestation before termination of pregnancy. Serum LDH levels were recorded and perinatal outcomes observed. The mean value of serum LDH in control group was 391.4 ± 10.9 IU/L, in mild pre eclampsia 531.5 ± 24.5 IU/L, in severe preeclampsia 922.1 ± 515.5 IU/L and in eclampsia 1497.6 ± 602.1 IU/L. The difference in serum LDH level was highly significant ($P < 0.001$). Higher LDH levels were associated with High Blood Pressure and had significant correlation with poor perinatal outcome. Thus we conclude that High serum LDH levels correlate well with poor maternal and perinatal outcomes in patients of Preeclampsia and Eclampsia.

Keywords: LDH, Eclampsia, preeclampsia

INTRODUCTION

Among the High Riskcategory, hypertensive disorders Pre-eclampsia and Eclampsia occur in about 6-8% of all pregnancies [1]. Pre-eclampsia and Eclampsia rank as one of major cause of maternal mortality and morbidity [2]. These conditions are largely preventable and once detected, they are treatable.

According to American College of Obstetrician and Gynaecologists, pre-eclampsia is defined as hypertension greater than 140/90 mm hg 4 hours apart associated with proteinuria greater than 0.3 gm/dL in a 24 hours urine collection or greater than 1 gm/l or $\geq +1$ on urine dipstick examination [3]. Eclampsia is defined as the presence of new-onset grand mal seizures in a woman with preeclampsia [3]. Serum LDH is mainly an intra cellular enzyme. It is responsible for interconversion of Pyruvate and Lactate in the cell [4]. In pre-eclampsia & eclampsia massive intracellular death occurs, so it's a very good marker to detect disease severity.

AIM & OBJECTIVES

The aim of our study was to evaluate the effect of Pre-eclampsia and Eclampsia on serum Lactic Dehydrogenase levels with an objective to determine the correlation of serum Lactic Dehydrogenase levels with maternal blood pressure levels and maternal outcome.

MATERIAL & METHOD

This prospective Hospital based study was conducted in Department of Obstetrics & Gynaecology, SMS Medical College, and Jaipur from March 2014 to October 2015. 140 pregnant Women in reproductive age between 20-35 years (including normotensive, mild preeclamptic, severe eclamptic & eclamptic women equally), were divided into Cases & Control.

Healthy normotensive pregnant women were taken as Control. Cases were divided into 3 Subgroups: -

- a) Mild preeclampsia
- b) Severe preeclampsia
- c) Eclampsia

Cases and controls were also divided into 3 groups on the basis of serum LDH: -

Group I - serum LDH <600 IU/L
 Group II - serum LDH 600-800 IU/L
 Group III - serum LDH >800 IU/L

All Pregnant healthy, preeclamptic and eclamptic women before termination of pregnancy after 28 wks of gestation were included in the study. Women with history of chronic hypertension, Diabetes mellitus, Liver, cardiac or renal disease or any other major illness, Women with history of drugs intake, smoking, alcoholism were excluded from study.

Patients were considered in mild preeclampsia group if SBP was between 140-160 mmHg and DBP between 90-110 mmHg and in severe preeclampsia group if SBP >160 mmHg or DBP >110 mmHg. Follow up was done for perinatal outcomes. Concentration of serum LDH was analysed in auto analyser, LDH was measured by kinetic method.

RESULTS & DISCUSSION-

As shown in table no.1 the mean value of serum LDH in control group was 391.4 ± 10.9 IU/L, in

mild pre eclampsia 531.5 ± 24.5 IU/L, in severe preeclampsia 922.1 ± 515.5 IU/L and in eclampsia 1497.6 ± 602.1 IU/L. The difference in serum LDH level was highly significant (P<0.001).

When the mean value of serum LDH for controls and mild pre-eclampsia women were compared it was found to be higher in the later group and the difference comes to be a statistically significant, when the mean value of serum LDH for controls and severe pre-eclampsia, and controls and eclampsia were compared, the values were statistically lower in controls group as compared to that of severe pre-eclampsia and eclampsia. The difference in serum LDH levels between mild preeclampsia and severe preeclampsia and between mild pre eclampsia and eclampsia was statistically significant (P<0.001).

Qublan HS *et al.*; [5] Jaiswar *et al.*; [6] Umasatyasri Y *et al.*; [7] demonstrated in their studies a significant association of serum LDH levels with severe preeclampsia.

Table 1: Distribution of cases according to serum LDH level

| S.no | Study Group | Mean Serum LDH (IU/L) | P – value |
|------|-----------------------|-----------------------|------------|
| 1. | Control | 391.4 ± 10.9 | P<0.05 S |
| 2. | Mild Preeclampsia | 531.5 ± 24.5 | P<0.05 S |
| 3. | Severe Preeclampsia | 922.1 ± 515.2 | P<0.05 S |
| 4. | Eclampsia | 1497.6 ± 602.1 | P<0.05 S |
| | F=54.6 d.f.=3136 | | P<0.001 HS |

Table no.2 shows that women with serum LDH level <600 IU/L, 36.84% women had systolic BP <140 mmHg, 53.68% had SBP between 140-160 mmHg, 9.48% had Systolic BP >160 mmHg. Women with serum LDH between 600-800 IU/L, none had normal systolic BP, 45.45% had Systolic BP between 140-160 mm Hg and 55.55% had Systolic BP >160 mmHg. Women with serum LDH level >800 IU/L none had normal Systolic BP, 29.41% had Systolic BP between 140-160 mmHg while 70.59% had Systolic BP >160 mmHg.

Women with serum LDH level <600 IU/L, 36.8% women had Diastolic BP <90 mmHg, 60% had DBP between 90-110 mmHg, 3.2% had Diastolic BP >110 mmHg. Women with serum LDH between 600-800 IU/L, none had normal Diastolic BP, 81.8% had Diastolic BP between 90-110 mmHg and 18.2% had

Diastolic BP >160 mmHg. Women with serum LDH level >800 IU/L none had normal Diastolic BP, 47.1% had Diastolic BP between 90-110 mmHg while 52.9% had Diastolic BP >110 mmHg.

It signifies that the patients with higher serum LDH levels were having higher Systolic and Diastolic blood pressure. The difference in Systolic and Diastolic blood pressure was statistically highly significant (P<0.001). The mean gestational age in women with serum LDH <600 IU/L was 37.6 ± 1.8 weeks, in women with serum LDH between 600-800 IU/L was 35.7 ± 1.5 weeks, in women with serum LDH levels >800 IU/L was 33.6 ± 2.5 weeks. The difference in mean gestational age was statistically significant (P<.001). Our study results were comparable with studies done by Jaiswar SP *et al.*; [6] and Uma Satyasri Y *et al.*; [7].

Table 2: Distribution of cases According to Serum LDH and Blood Pressure & Gestational Age

| S.no. A | | Systolic Blood Pressure (mm of Hg) | | | |
|---------|-----------------------------|-------------------------------------|-------------|-------------|-------------|
| | Serum LDH (IU/L) | <140 | 140 – 160 | >160 | |
| 1. | < 600 | 36.84% (35) | 53.68% (51) | 9.48% (9) | |
| 2. | 600 – 800 | 0 | 45.45% (5) | 55.55% (6) | |
| 3. | > 800 | 0 | 29.41% (10) | 70.59% (24) | |
| | $\chi^2 = 64$ d.f. = 4 | | | | P<0.001 HS |
| | | | | | |
| B. | | Diastolic Blood Pressure (mm of Hg) | | | |
| | Serum LDH | < 90 | – 110 | >110 | |
| 1. | <600 | 36.84% (35) | 60% (57) | 3.15% (3) | |
| 2. | 600 – 800 | 0 | 81.81% (9) | 18.19% (2) | |
| 3. | > 800 | 0 | 47.05% (16) | 52.95% (18) | |
| | $\chi^2 = 21.8$ d.f. = 4 | | | | P< 0.001 HS |
| | | | | | |
| C. | Serum LDH | Gestational Age (in weeks) | | | |
| 1. | < 600 | 37.6 ± 1.80 | | | |
| 2. | 600 – 800 | 35.72 ± 1.55 | | | |
| 3. | > 800 | 33.6 ± 2.522 | | | |
| | F=51.3 d.f.= 2137 | | | | P<0.001 HS |

Table no. 3 shows that women with serum LDH <600 IU/L, 4.21% had Post Partum Hemorrhage, 2.1% women had placental abruption, women with serum LDH 600-800 IU/L, 9.1% had abruption, 9.1% had CVA and 9.1% had Post Partum Hemorrhage and among women with serum LDH >800 IU/L, 11.8% women had abruption, 11.8% had HELLP syndrome, 11.8% had Post Partum Hemorrhage, 5.9% had CVA, 5.9% had renal failure and 2.9% had pulmonary

oedema. This signifies that increased serum LDH levels were associated with increased maternal complications. This difference was statistically highly significant.

A high serum level of LDH were shown to have a high predictive value for significant maternal morbidity in various different studies conducted by Martin JN Jr *et al.*; [5], Catanzerite VA *et al.*; [8], Qublan HS *et al.*; [9], Demir SC *et al.*; [10].

Table 3: Distribution of cases According to Serum LDH levels & Maternal Complications

| S.no | Maternal Complications | Serum LDH 600 IU/L | 600 – 800 | 800 |
|------|------------------------|--------------------|------------|------------|
| 1. | Normal | 93.68% (89) | 72.72% (8) | 50% (17) |
| 2. | Abruptio Placentae | 2.10% (2) | 9.09% (1) | 11.76% (4) |
| 3. | CVA | 0 | 9.09% (1) | 5.88% (2) |
| 4. | HELLP Syndrome | 0 | 0 | 11.76% (4) |
| 5. | PPH | 4.22% (4) | 9.09% (1) | 11.76% (4) |
| 6. | Pulmonary Edema | 0 | 0 | 2.94% (1) |
| 7. | Renal Failure | 0 | 0 | 5.88% (2) |

CONCLUSION

To conclude serum LDH levels has significant association with maternal blood pressure and with adverse maternal outcomes in preeclampsia and eclampsia. So it can be used as a prognostic tool for the severity of disease in preeclampsia and eclampsia. So in

hypertensive pregnant women with raised serum LDH levels, delivery should be conducted in a well-equipped tertiary care center with intensive antepartum, intrapartum and postpartum monitoring by expert obstetrician.

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