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Original Research

Serum LDH (Lactate Dehydrogenase) Levels in Normotensive and Preeclamptic- Eclamptic Pregnant Women

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ABSTRACT:

Background: This study was conducted to assess Serum LDH Levels in Normotensive and Preeclamptic-Eclamptic Pregnant Women. **Material and methods**: In this study, there were 100 women who were divided into two groups of 50 each with group 1 comprising of 50 normotensive pregnant women and group 2 comprising of 50 preeclamptic-eclamptic pregnant women. The women were informed about the procedure and were asked to give consent. Those who were willing to take part in the study and were ready to give consent had been included in the study while those who were unwilling to participate or give consent had been excluded from the study. Serum LDH levels had been measured in women among both the groups. Statistical analysis was conducted using SPSS software. **Results**: In this study, there were 100 women who were divided into two groups of 50 each with group 1 comprising of 50 normotensive pregnant women and group 2 comprising of 50 preeclamptic-eclamptic pregnant women. Mean serum LDH levels in women of group 1 were352.7 ± 101 IU/L and mean serum LDH levels in women of group 2 were 844.9 ± 565 IU/L. **Conclusion**: The serum LDH levels among normotensive pregnant women were far too low as compared to the serum LDH levels of preeclamptic-eclamptic pregnant women.

Keywords: pre-eclampsia, hypertension, normotensive, pregnancy, serum LDH.

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INTRODUCTION

Hypertensive disorders of pregnancy affect 10% of pregnancies and are defined by the International Society for the Study of Hypertension in Pregnancy (ISSHP) as new onset hypertension (≥140 mmHg systolic or ≥90 mmHg diastolic) after 20 weeks' gestation.[1,2] This umbrella definition includes chronic hypertension, gestational hypertension and preeclampsia (de novo or superimposed on chronic hypertension).

Both of these conditions can have significant impacts on maternal and foetal health in the immediate and long term. For the mother, this includes a two- to four-fold increased risk of long-term hypertension, a doubling of the risk of cardiovascular mortality and major adverse cardiovascular events, and a 1.5-fold increased risk of stroke.[3]

For the foetus, this includes antenatal risks of intra-uterine growth restriction (IUGR), preterm birth (most commonly iatrogenic), oligohydramnios, placental abruption, foetal distress, and foetal death in utero.[4-6] There is also growing evidence that in utero exposure to hypertensive disorders of pregnancy can result in significant long-term cardiovascular sequelae in the offspring, including early onset hypertension, and an increased risk of ischemic heart disease and stroke.[7] These sequelae have been associated with hypertensive pregnancies independent of other coexisting pregnancy complications.

This study was conducted to assess Serum LDH Levels in Normotensive and Preeclamptic-Eclamptic Pregnant Women.

MATERIAL AND METHODS

In this study, there were 100 women who were divided into two groups of 50 each with group 1 comprising of 50 normotensive pregnant women and group 2 comprising of 50 preeclamptic-eclamptic pregnant women. The women were informed about the procedure and were asked to give consent. Those who were willing to take part in the study and were ready to give consent had been included in the study while those who were unwilling to participate or give consent had been excluded from the study. Serum

LDH levels had been measured in women among both the groups. Statistical analysis was conducted using SPSS software.

RESULTS

Table 1: Group-wise distribution of subjects

Group	Number of women	Percentage
Group 1 (Normotensive pregnant women)	50	50%
Group 2 (Preeclamptic- eclamptic pregnant women)	50	50%
Total	100	100%

In this study, there were 100 women who were divided into two groups of 50 each with group 1 comprising of 50 normotensive pregnant women and group 2 comprising of 50 preeclamptic-eclamptic pregnant women.

Table 2: Serum LDH levels in women of both groups

Groups	Serum LDH levels(IU/L)
Group 1	352.7 ± 101
Group 2	844.9 ± 565

Mean serum LDH levels in women of group 1 were352.7 ± 101 IU/L and mean serum LDH levels in women of group 2 were 844.9 ± 565 IU/L.

DISCUSSION

Lactate generation and high glucose consumption are common in the human placenta, and glycolysis is an important energy pathway.[8] Hypoxia stimulates metabolic pathways, strengthening glycolysis and raising lactate dehydrogenase (LDH) activity, which converts pyruvate to lactate.[9] LDH is secreted as an intracellular enzyme that is highly sensitive and can be used to diagnose a variety of illnesses in which cellular integrity is compromised. Gene expression and lactate dehydrogenase activity are higher in the preeclampsia placenta than in normal pregnancy.[10] Hypoxia increases LDH isoenzyme activity in trophoblasts, resulting in increased lactate generation. LDH has five isoforms, with LDH type 4 being the most vulnerable to hypoxia and prevalent in the placenta. It is found in the placenta of preeclampsia patients.

Elevated levels of LDH, as a sign of cellular damage and dysfunction, can be utilized as a biochemical marker in PIH since it represents the severity of the disease, the prevalence of complications, and has also been demonstrated to correlate with fetomaternal outcomes. Certain consequences of PIH, such as abruptio placentae, hemolysis elevated liver enzymes low platelet count (HELLP) syndrome, and renal failure, when cellular disintegration occurs, have elevated LDH values.[11-13]

This study was conducted to assess Serum LDH Levels in Normotensive and Preeclamptic-Eclamptic Pregnant Women.

In this study, there were 100 women who were divided into two groups of 50 each with group 1 comprising of 50 normotensive pregnant women and group 2 comprising of 50 preeclamptic-eclamptic pregnant women. Mean serum LDH levels in women of group 1 were352.7 ± 101 IU/L and mean serum LDH levels in women of group 2 were 844.9 ± 565 IU/L.

Kasraeian M et al (2018)[14]determined serum biomarkers in detection of preeclampsia severity among pregnant women.Among 450 pregnant women with various severity of preeclampsia, serum biomarkers of aspartate aminotransferase (AST), alanine aminotransferase (ALT), lactate dehydrogenase (LDH), hemoglobin (Hb), platelet count (PLT), uric acid, direct bilirubin, total bilirubin, creatinine, and alkaline phosphatase were compared using area under the Receiver operating characteristic (ROC) curve and Area Under the Curve (AUC).The mean age of women was 30.63±6.43 years and with mean gestational age of 34.69±3.97 weeks. The mean level of LDH, ALT, uric acid, and creatinine were significantly higher in the women with severe type of preeclampsia compared to those with mild type. LDH level had ROC and AUC of more than 0.80, with highest sensitivity, and moderatespecificityin comparison to other markers. Biomarkers such as ALT, uric acid, and LDH were shown to be prognostic in detection of theseverity of preeclampsia. LDH was demonstrated to significantly be a better prognostic test in detection of preeclampsia severity.

Reddy Eleti M et al(2023)[15] conducted a study in which a total of 230 singleton pregnant women of 28-40 weeks of gestational age were enrolled. All women were divided into two groups - normotensive and preeclamptic-eclamptic groups; the second group was further divided into mild preeclampsia, severe preeclampsia, and eclampsia, based on blood pressure and the presence of proteinuria. Serum lactate dehydrogenase levels were measured in both groups and correlated with their fetomaternal outcome. Mean serum lactate dehydrogenase (LDH) level in eclamptic women was 1515.86 ± 754, in severely preeclamptic women was 932.2 ± 448, mild preeclamptic women were 580.5±213, while in normotensive women mean LDH level was 378.6 ± 124. The difference between normotensive and preeclamptic-eclamptic women was statistically significant ($p < 0.001$). The complications in the preeclamptic-eclamptic group were increased significantly in women with LDH > 800 IU/L, 600-

800 IU/L compared to those who had < 600 IU/L LDH levels. Serum LDH levels were significantly higher in women of preeclamptic-eclamptic group compared to the normotensive pregnant women. Higher LDH levels were positively correlated with disease severity and maternal complications like placental abruption, hemolysis elevated liver enzymes low platelet count (HELLP), disseminated intravascular coagulation (DIC), acute renal failure, intracranial hemorrhage, pulmonary edema, and maternal death and for fetal complications like preterm, intrauterine growth restriction (IUGR), APGAR at 1 minute < 7, APGAR at 5 minutes < 7, low birth weight (LBW), neonatal intensive care unit (NICU) admission and intrauterine fetal death (IUFD).

CONCLUSION

The serum LDH levels among normotensive pregnant women were far too low as compared to the serum LDH levels of preeclamptic-eclamptic pregnant women.

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