Journal of Cardiovascular Disease Research

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 06, 2023

LDH AS A TOOL FOR GRADING PREECLAMPSIA: A CASE CONTROL STUDY

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ABSTRACT

Background: Preeclampsia is a condition of hypertension (> 140/90 mm Hg) associated with proteinuria and edema in pregnant women after the 20th gestational week and most frequently near term.(1) Defective placentation and endothelial dysfunction are considered as the core features of preeclampsia.(2) Serum LDH level is a useful biomarker for cellular injury which may reflect the severity of preeclampsia and it's level might be a guideline for the management of patient.

Objectives:

(1) To assess serum LDH level in preeclamptic women.

(2) To compare the levels of LDH in different groups of preeclamptic women.

Material & Methods: This case control study was conducted in the Department of Biochemistry, Mahatma Gandhi Memorial Medical College (M.G.M.M.C.), Indore. Total 240 pregnant women during third trimester (28-40 weeks) aged 18 to 35 years were enrolled from the Department of Obstetrics & Gynecology of M.Y. Hospital, Indore. Among them, 92

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 06, 2023

were mild preeclamptic and 28 were severe preeclamptic women. Age matched 120 normotensive pregnant women were taken as control. Serum LDH level was estimated by spectrophotometric method in fully automatic analyser.

Results: In this Study, serum LDH level was significantly higher (P<0.001) in preeclamptics compared to controls. Again, this value was significantly higher in severe preeclamptics than mild preeclamptics.

Conclusion: From this study, it can be concluded that elevated serum LDH level is associated with severity of preeclampsia. Therefore estimation of LDH levels in preeclamptic women may be useful for the proper management of these patients, which can further decrease the morbidity
and associated mortality.

INTRODUCTION-

Hypertension (>140/90 mm Hg) associated with proteinuria and edema in pregnant women after the 20th gestational week (most frequently near term) is defined as preeclampsia.[(1)] Endothelial cell dysfunction can contribute to inappropriate vasoconstriction, platelet aggregation, activation of the coagulation system and ultimately decreased blood flow to organs.[(3)] The incidence of preeclampsia is 2-10%.[(4)] In India, the incidence of preeclampsia is reported to be 8-10% among the pregnant women. According to a study, the prevalence of hypertensive disorders of pregnancy is 5-7% with preeclampsia in India.[(5 ,6)]

MILD preeclampsia is defined as onset of hypertension after 20 weeks of gestation with systolic blood pressure of >140 to <160 mmHg or a diastolic blood pressure >90 to <110 mmHg in combination with proteinuria >0.3gm to < 5gm per day.[(7-8)]

SEVERE preeclampsia is when systolic blood pressure is greater than 160 mmHg or diastolic blood pressure is greater than 110 mmHg and is associated with proteinuria greater than or equal to 5 gm per day. Severe preeclampsia is accompanied by thrombocytopenia, pulmonary edema, oliguria.[(7)]

Causes -Defective placentation and endothelial dysfunction both are considered as the core features of preeclampsia.[(8-9)] Endothelial cell dysfunction can contribute to inappropriate vasoconstriction, platelet aggregation, activation of the coagulation system and ultimately decreased blood flow to organs.

Lactate dehydrogenase (LDH) is an intracellular enzyme that converts Lactic acid to pyruvic acid and its elevated blood level indicates cellular death followed by its leakage to circulation.

So, serum LDH levels can be used to assess the extent of cellular death and thereby the severity of disease. It can be further used in making decision regarding the management strategies to improve maternal and fetal outcome.

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Material and Methods-

This case control study was conducted in the Department of Biochemistry, Mahatma Gandhi Memorial Medical College (M.G.M.M.C.), Indore. Total 240 pregnant women during third trimester (28-40 weeks) aged 18 to 35 years were enrolled from the Department of Obstetrics & Gynecology of M.Y. Hospital, Indore. Among them, 92 were mild preeclamptic and 28 were severe preeclamptic women. Age matched 120 normotensive pregnant women were taken as control. Serum LDH level was estimated by spectrophotometric method in fully automatic analyser.

Inclusion Criteria - Singleton pregnancy, age 20 to 30 years, Preeclamptic women whose blood pressure was normal during first 20 weeks of gestation, No previous history of hypertension.

All the cases were in the third trimester of pregnancy (>28 wks of gestation).

Exclusion criteria - Patients with Diabetes, Renal failure, Hemolytic anemia, chronic hypertension, gestational diabetes, multiple pregnancy, smoking and alcoholism, liver disease, hepatotoxic drugs, stroke, coronary artery disease, chronic lung disease, connective tissue disorders, disseminated intravascular coagulation and seizures were excluded.

RESULTS

- In this Study, serum LDH level was significantly higher (P<0.001) in preeclamptics compared to controls. Again, this value was significantly higher in severe preeclamptics than mild preeclamptics.

TABLE 1.BASELINE CHARACTERISTICS IN DIFFERENT GROUPS

Parameter	Control (n=120)		Mild preeclampsia (n=92)		Severe preeclampsia (n=28)		P value
	Mean	±SD	Mean	±SD	mean	±SD	
Age (years)	35.66	8.86	34.24	6.26	37.24	7.46	0.160
SBP (mmHg)	115.05	4.14	148.37	4.28	172.21	5.39	<0.001
DBP (mmHg)	80.21	2.02	99.56	4.50	119.92	5.34	<0.001

TABLE-2.Comparison of mean LDH levels among study groups

Parameter	Control (n=120)		Mild preeclampsia (n=92)		Severe preeclampsia (n=28)		P value
	mean	±SD	mean	±SD	mean	±SD	mean
LDH (U/L)	186.69	±31.48	404.55	±42.69	715.07	±33.76	<0.001

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FIGURE -1.COMPARISON OF SERUM LDH LEVELS (IN U/L) IN DIFFERENT GROUPS

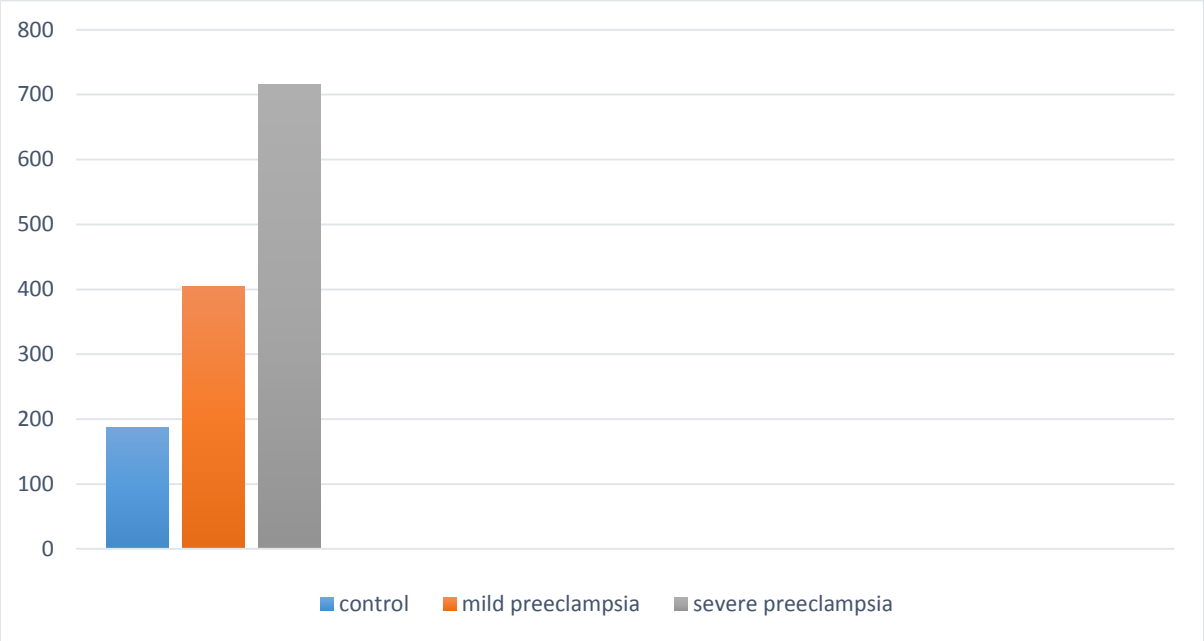

Figure-1: mean serum LDH level in different groups depicts that severe preeclamptic women had higher mean serum LDH level than mild preeclamptic and normotensive pregnant women.

DISCUSSION-

Mean serum LDH level is significantly higher (P<0.001) in preeclamptics compared to controls. Again, this value is also significantly higher in severe preeclamptics than mild preeclamptics.

Babu R, Venugopal B et all and Qublan HS et all in their study also suggested LDH as a potential marker to predict the severity of preeclampsia and also an indicator for multiorgan involvement .[8,9] Murthy K., O., B. S., D., & Siddiqui, S. observed that higher values of LDH were found in mild and severe preeclamptic women than the normal pregnant women in their third trimester and the difference was statistically significant.[10] Another study by Jaiswar SP et all stated that maternal and perinatal complications were associated with higher LDH levels in preeclampsia patients.[11] Munde SM et all said that hypoperfusion induced ischaemic injury to hepatic cells and other organs cause increased release of intracellular LDH to circulation[12] Nosrat BS et all and Gruccio S et all did not find significant difference of serum LDH level between preeclamptic women and healthy pregnant women [13,14]

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CONCLUSION-From this study, it can be concluded that elevated serum LDH level is associated with severity of preeclampsia. Therefore estimation of LDH levels in preeclamptic women may be useful for the proper management of these patients, which can further decrease the morbidity and mortality.

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