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Original Research Article.

Estimation of Serum Lactate Dehydrogenase in Eclampsia Patients: An Institutional Based Study

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ABSTRACT

Background: Eclampsia is convulsions occurring in a preeclamptic woman, which cannot be attributed to another cause. The effects of lactate dehydrogenase (LDH) in pregnancy related complications like preeclampsia is now gaining attention. Hence; the present study was conducted to assess serum lactate dehydrogenase in Eclampsia patients.

Materials and Methods: Study group comprised of patients admitted to the labour room as emergency cases. A total of 50 Eclampsia patients were enrolled in the present study. Another set of 50 patients were included as control group. Inclusion criteria for including the patients into Eclampsia group: All the hematological parameters of all the patients were recorded in lateral recurrent position. Serum samples were obtained from all the patients and were sent to central laboratory for assessment of LDH levels.

Results: Mean LDH levels of the subjects of the eclampsia group and the control group was 1548.11 IU/L and 269.8 IU/L respectively. Mean serum LDH concentration of the subjects of the eclampsia group was significantly higher than that of control group.

Conclusion: LDH levels are significantly altered in eclampsia patients.

Keywords: Eclampsia, Lactate dehydrogenase.

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INTRODUCTION

Preeclampsia is a pregnancy specific syndrome that can virtually affect every organ system, occurring after 20 weeks of gestation. It is a progressive disease with a variable mode of presentation and rate of progression. It is one of the leading causes of maternal and fetal morbidity and mortality. Eclampsia is convulsions occurring in a preeclamptic woman, which cannot be attributed to another cause.[1-3]

The biological consequences of increased lactate levels within the placenta resulting from increased lactate dehydrogenase activity in preeclampsia are unknown. Lactate could serve as a signaling compound to coordinate cell and systemic function. For example, it could serve as fuel for the fetus within the hypoxic environment through glucose generation. Hypoxia induces LDH isozyme activity in trophoblasts resulting in higher lactate production. Primary human trophoblast cells demonstrated an increase in LDHA mRNA when exposed to hypoxic conditions confirming LDHA isozyme presence in placental trophoblasts and their response to hypoxia. The effects of LDH in pregnancy related complications like preeclampsia is now gaining attention.[2,3] LDH is an intracellular enzyme and its level is increased in these women due to cellular death. Though cellular enzymes in the extracellular space have no metabolic function, they are still of benefit because they serve as indicators suggestive of disturbance of cellular integrity induced by pathological conditions and is used to detect cell damage or cell death.[4,5] So, serum LDH levels can be used to assess the extent of cellular death and thereby the severity of disease.[6]

Hence; the present study was conducted to assess serum lactate dehydrogenase in Eclampsia patients.

MATERIALS AND METHODS

The present study was conducted in the Department of Obstetrics and Gynaecology, Rajshree Medical Research Institute & Hospital, Bareilly, Uttar Pradesh (India) and it included assessment of serum lactate dehydrogenase in Eclampsia patients. Study group comprised of patients admitted to the labour room as emergency cases. Ethical approval was obtained from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A questionnaire was framed and all the clinical, obstetric

and laboratory findings were separately recorded. A total of 50 Eclampsia patients were enrolled in the present study. Another set of 50 patients were included as control group. Inclusion criteria for including the patients into Eclampsia group:

All proven cases of eclampsia admitted in the department of obstetrics and gynecology.

- Subjects with negative history of presence of any malignancy
- Subjects less than 45 years of age
- Subjects with negative history of presence of epilepsy

All the hematological parameters of all the patients were recorded in lateral recurrent position. Serum samples were obtained from all the patients and were sent to central laboratory for assessment of LDH levels.

All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test was used for assessment of level of significance.

RESULTS

In the present study, a total of 50 eclampsia patients and a total of 50 healthy controls were enrolled. Mean age of the patients of the eclampsia group and the control group was 26.8 and 27.1 years. Mean weight of the patients of the control group and the eclampsia group was 61.8 Kg and 63.1 Kg respectively. Mean LDH levels of the subjects of the eclampsia group and the control group was 1548.11 IU/L and 269.8 IU/L respectively. Mean serum LDH concentration of the subjects of the eclampsia group was significantly higher than that of control group.

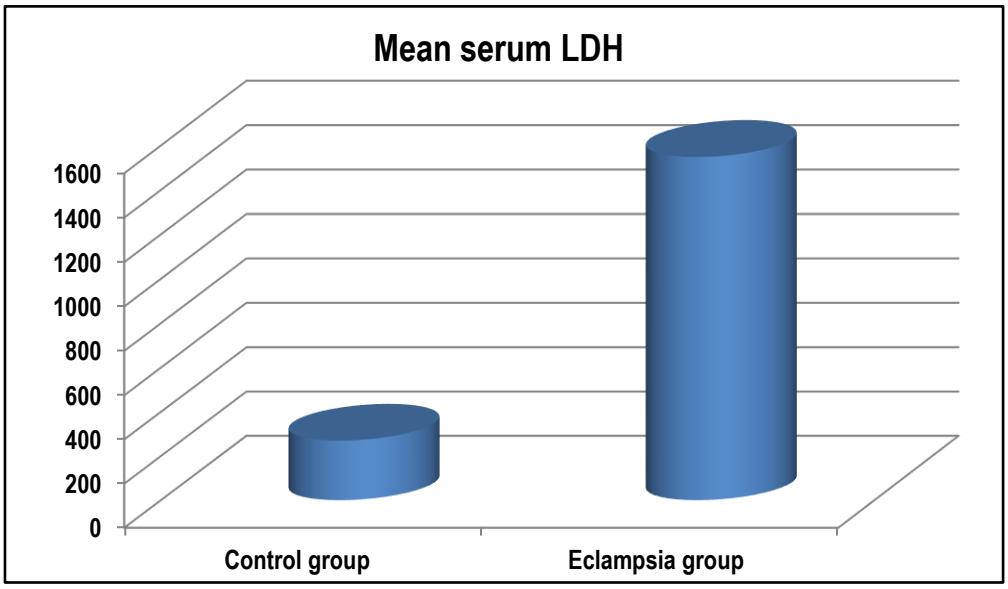
Table 1: Demographic data

Parameter	Control group	Eclampsia group
Number of patients	50	50
Mean age (years)	26.8	27.1
Mean weight (Kg)	61.8	63.1

Table 2: Comparison of LDH levels (IU/L)

Parameter	Control group	Eclampsia group	p- value
Mean serum LDH	269.8	1548.11	0.00 (Significant)
SD	120.6	943.8	

Graph 1: Mean LDH levels (IU/L)



DISCUSSION

Pregnancy is characterized by significant metabolic and hemodynamic changes that begin early in the gestational period. Major hemodynamic changes include an increase in the cardiac output during the first trimester, sodium and water retention leading to plasma volume expansion with a peak around week 30, and reductions in the systemic vascular resistance and systemic blood pressure. The reduction of the systemic vascular resistance is around 25% and is due to the increase in vasodilating agents, like nitric oxide and prostacyclin production, and the decrease in the sensitivity to norepinephrine and angiotensin. Eclampsia is a uniquely pregnancy-related disorder that manifests as new onset of generalized tonic colonic seizures. It typically occurs after 20 weeks of concluded gestation, although it may occur sooner with plural gestations or molar pregnancies, and may additionally occur in the 6-week postpartum window. It represents the severe end of the preeclampsia spectrum.[7- 9]

In the present study, a total of 50 eclampsia patients and a total of 50 healthy controls were enrolled. Mean age of the patients of the eclampsia group and the control group was 26.8 and 27.1 years.

Mean weight of the patients of the control group and the eclampsia group was 61.8 Kg and 63.1 Kg respectively. Lactate dehydrogenase is an intracellular enzyme and it's elevated blood level indicates cellular death followed by it's leakage to circulation. Recently, LDH level has been suggested as potential markers to predict the severity of preeclampsia and indicator for multiorgan involvement. Several studies reported that serum LDH level increases with severity of preeclampsia and showed significant correlation with high blood pressure and poor maternal and perinatal outcomes. In their study, the symptoms and complications of preeclampsia along with perinatal mortality were significantly increased in patients with serum LDH > 800 IU/L.[10, 11]

In the present study, mean LDH levels of the subjects of the eclampsia group and the control group was 1548.11 IU/L and 269.8 IU/L respectively. Mean serum LDH concentration of the subjects of the eclampsia group was significantly higher than that of control group.

Jaiswar SP et al correlated the severity of the disease, maternal and perinatal outcome with Lactic Dehydrogenase (LDH) levels in serum in patients of preeclampsia and eclampsia. A prospective comparative study was conducted in the department of Obstetrics and Gynecology in the collaboration with department of Pathology, CSM Medical University, Lucknow. Out of 146 women studied, 39 were normal pregnant women, 35 were of mild preeclampsia, 36 of severe preeclampsia and 36 of eclampsia. LDH levels were significantly elevated in women with preeclampsia and eclampsia (<0.001). Higher LDH levels had significant correlation with high blood pressure (P < 0.10) as well as poor maternal and perinatal outcome. High serum LDH levels correlate well with the severity of the disease and poor outcomes in patients of preeclampsia and eclampsia.[7] Ciryam SS et al correlated serum LDH levels and seasonal variation in preeclampsia and eclampsia. It is a retrospective observational study. Data for 102 cases were collected from the parturition register and patient discharge record from January to December 2016. All singleton pregnant women who came to R L Jalappa Hospital with severe preeclampsia and eclampsia were included in the study. Total of 102 patients were studied. Incidence of the disease was most commonly seen in younger age group, which was statistically significant (p=0.020). Even though most of the cases presented in winter, there was no statistically significant association between seasonal variation in occurrence of the disease and serum LDH levels. LDH rose to >800IU/L in the cases was seen more in the younger age group. This study only showed that preeclampsia and eclampsia occurred most commonly in younger women.[8]

Few studies showed association of low birth weight of infants with increase in serum LDH levels. This was in contrary to Qublan HS et al who did not find any significant association. Bera S et al showed LDH is a good parameter to predict severity of PIH and bad fetal outcome.[5, 8- 10]

CONCLUSION

From the above results, it can be concluded that LDH levels are significantly altered in eclampsia patients. However; further studies are recommended.

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