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Comparison of serum LDH in preeclampsia versus normotensive pregnant women

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Abstract
Background: Hypertensive disorders of pregnancy, particularly pre-eclampsia, are responsible for 10% to 15% of maternal deaths. The present study was conducted to compare LDH in preeclampsia versus normotensive pregnant women.
Materials & Methods: The present study was conducted on 120 pre- eclampsia pregnant women age ranged 18-36 years of third trimester. Equal number of healthy women (group I) was taken as control. Patients were divided into mild preeclampsia (60) (group II- SBP >140 to <160mm Hg, DBP >90 to < 110 mm Hg) and severe preeclampsia patients (60) (group III- SBP > 160mm Hg, DBP > 110mm Hg). In all patients LDH level, BMI and proteinuria was determined.
Results: Serum LDH level was significantly higher in preeclamptics compared to those of control. LDH was significantly higher in severe preeclamptics than those of mild preeclamptics.
Conclusion: Authors found that there was significantly higher level of LDH in eclampsia and preeclampsia women as compared to normotensive women.

Keywords: Preeclampsia, LDH, proteinuria

Introduction
Pregnancy is a physiological state associated with varied biochemical and maternal adaptation in response to physical stimuli provided by foetus and placenta. HDP affect 6-8% of all pregnancies and along-with hemorrhage and infection, they form a complex triad, contributing immensely to maternal morbidity and mortality [1]. Hypertensive disorders of pregnancy, particularly pre-eclampsia, are responsible for 10% to 15% of maternal deaths. In developing countries, incidence of pre-eclampsia and its morbidity is much higher as compared to high income countries. Over the years, maternal deaths due to pre-eclampsia have been significantly reduced by early diagnosis and management in developed countries; on the contrary it is still responsible for 19% of annual maternal deaths in developing countries including India [2].
LDH enzymes are ubiquitous to all the major organ systems e.g. heart, kidney, muscle, leukocytes and erythrocytes [3]. Cellular enzymes in the extracellular space although of no further metabolic function in this space, 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]. Serum LDH is abnormal in a host of disorders, therefore the total serum LDH is highly sensitive but nonspecific test. In order to optimize the diagnostic value, LDH isoenzymes can be measured. This can be further used as help in making decision, regarding the management strategies to improve the maternal and fetal outcome [5]. The present study was conducted to compare LDH in preeclampsia versus normotensive pregnant women.

Materials & Methods
The present study was conducted in the Department of Obstetrics & Gynaecology of Acharaya Shri Chander Institute of medical sciences, Jammu. It comprised of 120 pre- eclampsia pregnant women age ranged 18-36 years of third trimester. Equal number of healthy women (group I) age ranged 18-36 years of third trimester was taken as control. All patients were informed regarding the study and written consent was obtained. Ethical approval was obtained from institute prior to the study.
General information such as name, age, gender etc. was recorded. A thorough clinical examination was done. Patients were divided into mild preeclampsia (60) (group II- SBP >140 to <160mm Hg, DBP >90 to < 110 mm Hg) and severe preeclampsia patients (60)

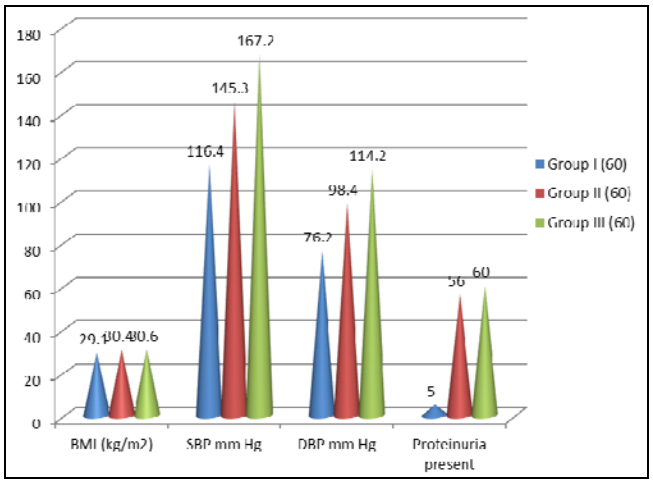
(group III- SBP > 160mm Hg, DBP > 110mm Hg). In all patients LDH level was assessed with continuous spectrophotometric method. BMI was calculated and blood pressure was measured. Presence of proteinuria was determined by conventional heat coagulation test. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Assessment of parameters

Parameters	Group I (60)	Group II (60)	Group III (60)	P value
BMI (kg/m2)	29.1	30.4	30.6	0.91
SBP mm Hg	116.4	145.3	167.2	0.05
DBP mm Hg	76.2	98.4	114.2	0.04
Proteinuria present	5	56	60	0.001

Table 1, graph 1 shows that mean BMI of group I patients was 29.1 kg/m^2, group II was 30.4 kg/m^2 and group III was 30.6 kg/m^2. The mean SBP in group I was 116.4 6.2 mm Hg in group I, mm Hg, in group II was 145.3 mm Hg and in group III was 167.2 mm Hg, DBP was 76.2 mm Hg, in group II Was 98.4 mm Hg, and in group III was 114.2 mm Hg. Proteinurea was present in 5, 56 and 60 patients in group I, II and III respectively. The difference was significant (P< 0.05).

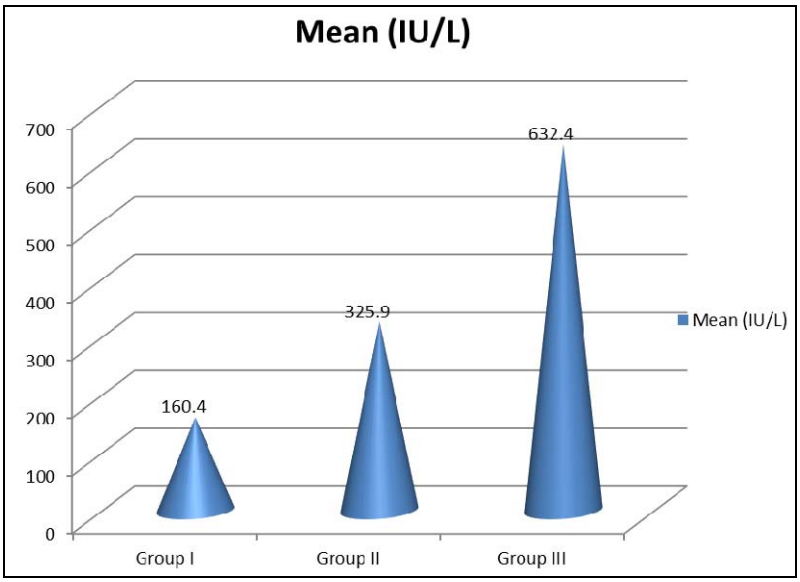


Graph 1: Assessment of parameters

Table 2: Comparison of LDH level in all patients

Groups	Mean (IU/L)	P value
Group I	160.4	0.001
Group II	325.9	
Group III	632.4	

Table 2, graph 2 shows that mean LDH level in group I patients was 160.4 IU/L, group II patients had 325.9 IU/L, group III patients had 632.4 IU/L and in eclampsia patients had 658.5 IU/L. The difference was significant (P< 0.05).



Graph 2: Comparison of LDH level in all patients

Discussion

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 [6]. The clinical findings manifest as maternal syndrome or feta or both with subsequent increase in the perinatal and maternal morbidity and mortality. Lactic dehydrogenase (LDH) is an intracellular enzyme that converts lactic acid to pyruvic acid, and elevated levels indicate cellular death and leakage of the enzyme from the cell. High levels of LDH were found in association with severe pre-eclampsia in a limited number of studies [7]. The present study was conducted to compare LDH in preeclampsia versus normotensive pregnant women.

In present study, mean BMI of group I patients was 29.1 kg/m^2, group II was 30.4 kg/m^2 and group III was 30.6 kg/m^2. The mean SBP in group I was 116.4 6.2 mm Hg in group I, mm Hg, in group II was 145.3 mm Hg and in group III was 167.2 mm Hg, DBP was 76.2 mm Hg, in group II Was 98.4 mm Hg, and in group III was 114.2 mm Hg. Proteinurea was present in 5, 56 and 60 patients in group I, II and III respectively.

Qublan *et al.* [8] included 200 pre-eclamptic women (121 with mild and 79 with severe pre-eclampsia) and 200 healthy normotensive controls. The symptoms and complications of severe pre-eclampsia along with fetal outcome were analyzed

according to the levels of LDH. Severely pre-eclamptic patients were significantly younger, with low gravidity and parity. On the other hand, they had significantly increased systolic and diastolic pressure and liver enzymes, uric acid, urine albumin, and LDH levels. The symptoms and complications of pre-eclampsia along with perinatal mortality were increased significantly in patients with LDH >800 IU/l compared with those who had lower levels. Authors concluded that lactate dehydrogenase is a useful biochemical marker that reflects the severity of pre-eclampsia. In our study, LDH has been evaluated as a biochemical marker for preeclampsia and as a prognosticator of the disease severity. Detection of high-risk patients with increased levels of LDH mandate close monitoring and management to prevent maternal and fetal morbidity and mortality.

We observed that mean LDH level in group I was 160.4 IU/L, in group II was 325.9 IU/L, in group III patients was 632.4 IU/L. Beyer *et al*. [9] assessed the prognostic significance of the value of serum LDH as a marker of preeclampsia – eclampsia and its severity. Higher serum LDH levels were associated with increased incidence of maternal complications like abruption placenta HELLP syndrome, cerebrovascular accidents etc. in the present study. There was an increase in maternal morbidity with increasing serum LDH levels. Authors found that high serum LDH levels have significant association with severity of disease and maternal and fetal outcomes in patients of preeclampsia and eclampsia.

Catanzerite *et al*. [10] reported a subgroup of patients who had elevated levels of LDH manifested with hemolysis, elevated liver enzymes, low platelet count (HELLP) syndrome and were at a high risk for developing maternal mortality. Afroz *et al*. [11] concluded that there was a statistically significant relation between maternal complications and high LDH levels. It was noted that in early onset severe preeclampsia, LDH levels before delivery were significantly higher in the abruption group.

Conclusion

Authors concluded that elevated serum LDH level is associated with severity of preeclampsia. The assessment of serum LDH level in preeclamptic women may be useful for the proper management of patients to decrease maternal and fetal morbidity and mortality

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