

Serum LDH in preeclampsia and normotensive pregnant women- A clinical study

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ABSTRACT

Background: The present study was conducted to compare LDH level in preeclampsia versus normotensive pregnant women.

Materials & Methods: The present study was conducted on 52 pre- eclampsia pregnant women of third trimester. Equal number of healthy women was taken as control. LDH level was assessed with continuous spectrophotometric method in all patients.

Results: The mean BMI of group I patients was 28.8 kg/m², group II was 30.2 kg/m² and group III was 30.4 kg/m². Proteinuria was present in 10 patients in group I, 24 patients in group II and 22 patients in group III. The difference was significant (P < 0.05). The mean LDH level in group I patients was 782.4 IU/L, group II patients had 462.8 IU/L and group III patients had 138.4 IU/L. The difference was significant (P < 0.05). Maternal complication such as abruption was seen in 3 in group I, 2 in group II and none in group III patients.

Conclusion: Authors found that serum LDH level is elevated in preeclampsia patients. Thus LDH may be indicative of severity and outcome of hypertensive disorders of pregnancy.

Key words: 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

Hypertension during pregnancy is a major health problem. It is one of the leading causes of perinatal morbidity and mortality.² Preeclampsia (PE) is a theoretical disease with a pathogenesis that is not clearly understood yet. Lately, vascular system pathology and vasoconstriction have been blamed as causes for preeclampsia. During early pregnancy, there is increased body fat accumulation associated with increased lipogenesis, while in late pregnancy there is accelerated breakdown of fat depots which play an important role in foetal development.³

Lactate Dehydrogenase (LDH) is mainly an intracellular enzyme. It is responsible for interconversion of pyruvate and lactate in the cells. Its levels are several times greater inside the cells than in the plasma.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. It consisted of 52 preeclampsia pregnant women of third trimester. Equal number of healthy women was taken as control. Ethical clearance was obtained from institute prior to the study. All patients were informed regarding the study and written consent was obtained.

General information such as name, age, gender etc. was recorded. Patients were divided into 3 groups. Group I patients were mild preeclampsia with SBP >140 to <160mm Hg, DBP >90 to < 110 mm Hg), group II patients were severe preeclampsia patients with SBP > 160mm Hg, DBP > 110mm Hg) and group III patients were control. LDH level was assessed with continuous spectrophotometric method in all patients. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I Distribution of patients

| Groups | Group I | Group II | Group III |
|--------|--------------------|-------------|------------|
| SBP | >140 to <160 mm Hg | > 160mm Hg | <110 mm Hg |
| DBP | >90 to < 110 mm Hg | > 110 mm Hg | < 90 mm Hg |
| Number | 26 | 26 | 26 |

Table I shows that group I patients were mild preeclampsia with SBP >140 to <160mm Hg, DBP >90 to < 110 mm Hg), group II patients were severe preeclampsia patients with SBP > 160mm Hg, DBP > 110mm Hg) and group III patients were control. Each group had 26 patients.

Table II Assessment of parameters

| Parameters | Group I | Group II | Group III | P value |
|--------------------------|---------|----------|-----------|---------|
| BMI (kg/m ²) | 28.8 | 30.2 | 30.4 | 0.91 |
| Proteinuria present | 10 | 24 | 22 | 0.05 |

Table II, graph I shows that mean BMI of group I patients was 28.8 kg/m², group II was 30.2 kg/m² and group III was 30.4 kg/m². Proteinurea was present in 10 patients in group I, 24 patients in group II and 22 patients in group III. The difference was significant (P< 0.05).

Graph I Assessment of parameters

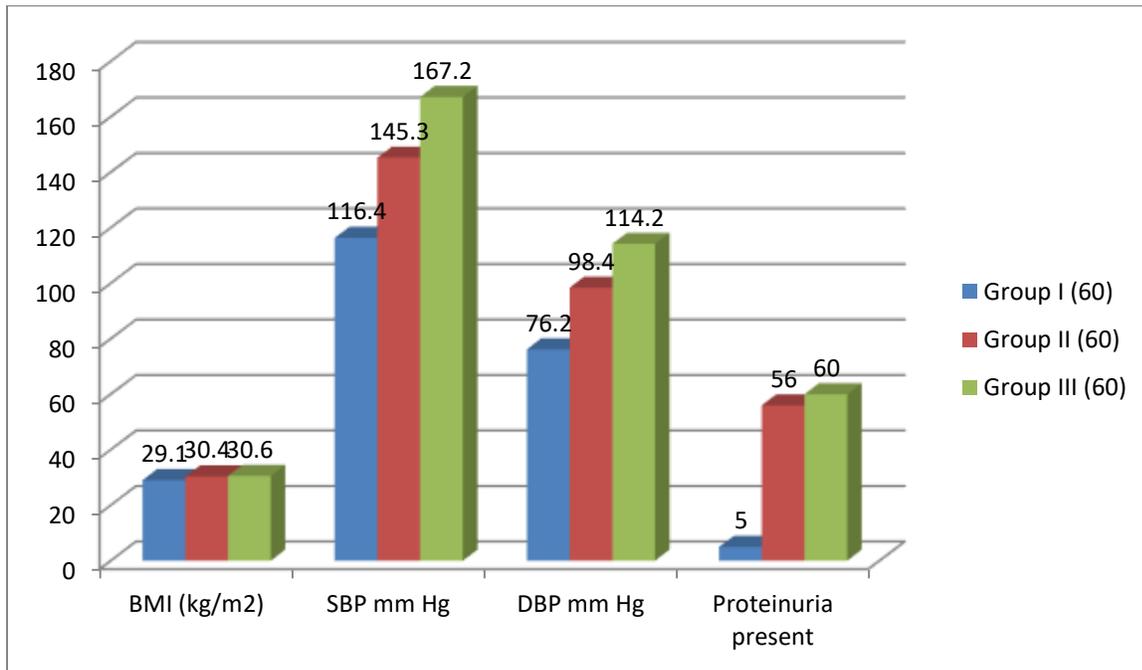
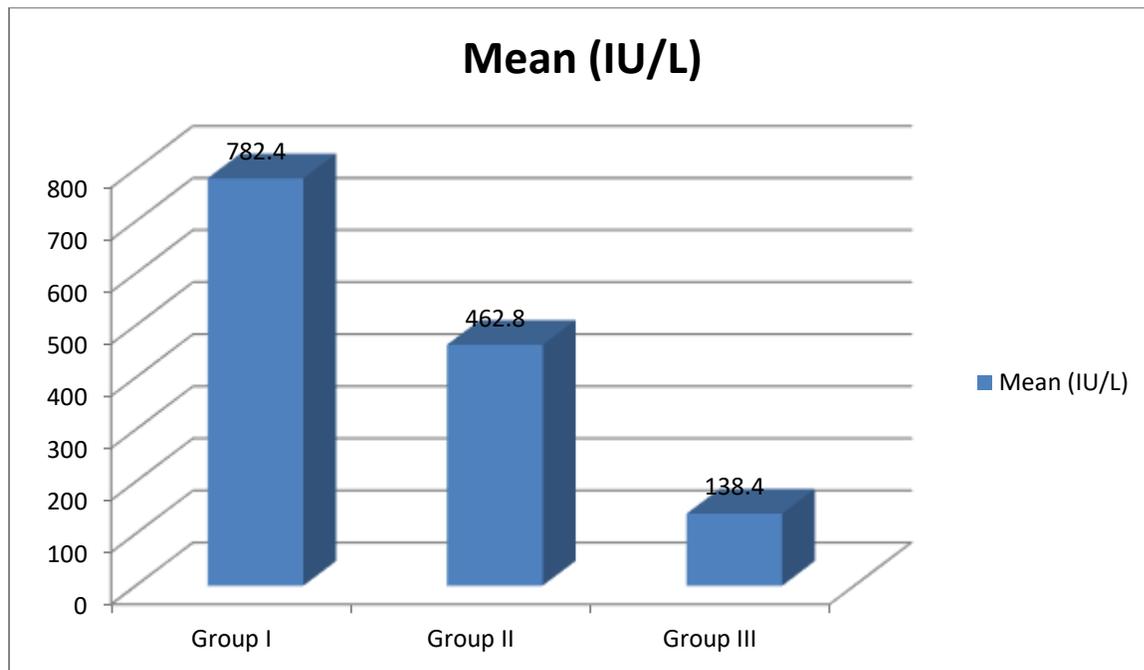


Table III LDH level in all groups

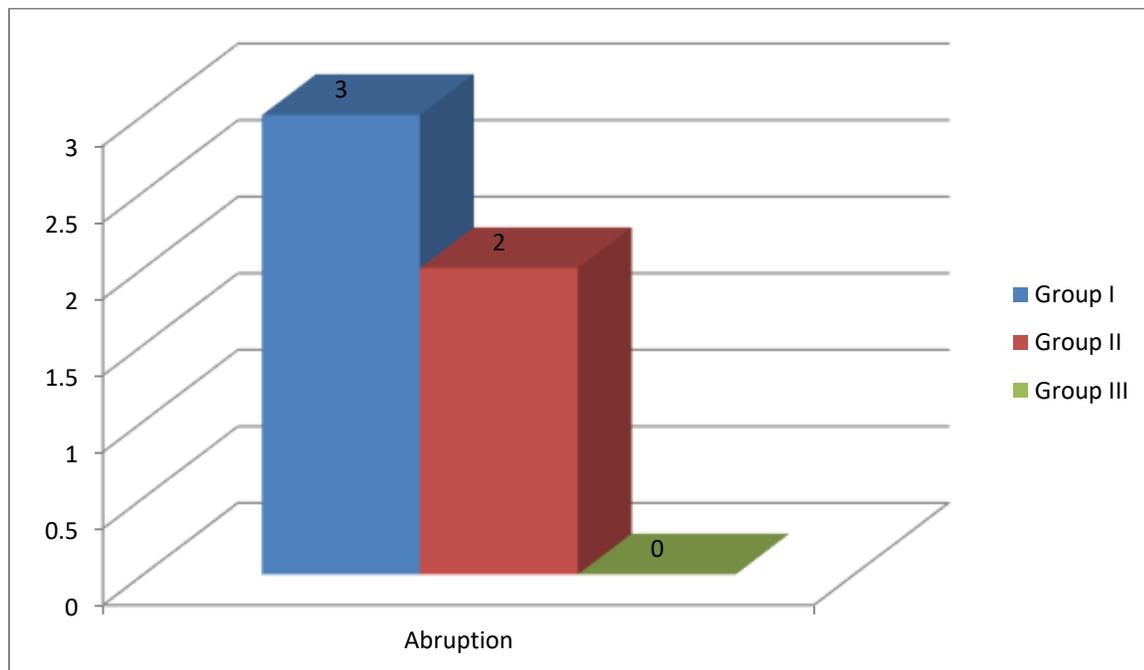
| Groups | Mean (IU/L) | P value |
|-----------|-------------|---------|
| Group I | 782.4 | 0.001 |
| Group II | 462.8 | |
| Group III | 138.4 | |

Table III, graph II shows that mean LDH level in group I patients was 782.4 IU/L, group II patients had 462.8 IU/L and group III patients had 138.4 IU/L. The difference was significant (P< 0.05).

Graph II LDH level in all groups



Graph III Maternal Complications



Graph II shows that maternal complication such as abruption was seen in 3 in group I, 2 in group II and none in group III patients.

Discussion

Preeclampsia is a common medical complication of pregnancy. In India, the incidence of preeclampsia is reported to be 8% - 10% of the pregnancies.⁶ It contributes significantly to maternal and foetal mortality and morbidity. Preeclampsia is a multisystem disorder characterised by hypertension to the extent of 140/90 mmHg or more, proteinuria (≥ 300 mg/day) and oedema induced by pregnancy after 20th week.⁷ The present study was conducted to compare LDH in preeclampsia versus normotensive pregnant women.

In present study, group I patients were mild preeclampsia with SBP >140 to <160 mm Hg, DBP >90 to <110 mm Hg), group II patients were severe preeclampsia patients with SBP > 160 mm Hg, DBP > 110 mm Hg) and group III patients were control. Each group had 26 patients. Borna et al⁸ compared the serum levels of Lactate Dehydrogenase (LDH), in preeclampsia versus normotensive pregnant woman and correlate their levels with the severity of the disease. 50 antenatal patients having preeclampsia and equal no. of normotensive patients were chosen. About 3 mL of blood was drawn under aseptic precautions from selected subjects in a plain vial for serum. Serum was separated by centrifugation and used for estimation of serum levels of LDH. We have observed significant difference in serum LDH in hypertensive group patients in comparison with normotensive patients.

In present study, mean BMI of group I patients was 28.8 kg/m², group II was 30.2 kg/m² and group III was 30.4 kg/m². Proteinuria was present in 10 patients in group I, 24 patients in group II and 22 patients in group III. The mean LDH level in group I patients was 782.4 IU/L, group II patients had 462.8 IU/L and group III patients had 138.4 IU/L. Qublan et al⁹ 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.

We found that maternal complication such as abruption was seen in 3 in group I, 2 in group II and none in group III patients. Many theories have suggested that endothelial dysfunction caused by factors released from ischaemic placenta may be a causative factor for disease pathogenesis. They concluded that serum LDH can be a useful marker for the prediction of adverse outcome of pregnancy in severe preeclampsia. Serum LDH is also found to be a useful predictor of birth of small for gestational age infants in preeclamptic pregnancy. There is importance of amniotic serum LDH level for the prediction of foetal growth restriction. It is found that LDH-A isoenzyme is immunolocalised primarily in the foetal endothelial cells, while LDH-B isoenzyme is predominantly present in syncytiotrophoblasts.¹⁰

Conclusion

Authors found that serum LDH level is elevated in preeclampsia patients. Thus LDH may be indicative of severity and outcome of hypertensive disorders of pregnancy.

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