



Role of Serum Lactate Dehydrogenase As A Prognostic Biochemical Marker in Pre-Eclampsia And Eclampsia

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ABSTRACT

The aim of the study was to find out the role of serum lactate dehydrogenase as a marker to assess and predict the severity and complications of preeclampsia and eclampsia. This study was conducted in the Department of Obstetrics and gynaecology, Tirunelveli Medical College, Tirunelveli. A total of 200 women were studied. They were divided into control(n = 100) severe preeclampsia (n = 42), eclampsia(n = 58). Demographic and hematological parameters were studied including LDH levels. The incidence of severe preeclampsia % and eclampsia %. The patients were younger with lower gravidas. They had marked elevation of systolic and diastolic pressure, liver enzymes, uric acid, and LDH levels. Serum urea and creatinine were normal in majority of cases. The complications like abruptio, DIC, ARF, CVA, MODS, Shock were associated with high levels of serum LDH >800 IU/L. The incidence of adverse perinatal outcome was higher in PE & E patients with high serum LDH level. LDH is the earliest marker which predicts the severity and complications that are preventable if identified at an earlier stage and properly managed.

KEYWORDS

Serum lactate dehydrogenase - LDH – Preeclampsia-Eclampsia – biochemical marker

Introduction

Pregnancy leads to marked anatomical, physiological, and metabolic changes in the mother. One of the commonest complication is hypertension which further complicates into preeclampsia(PE)and eclampsia(E).10% of all pregnancies are complicated by hypertension.

Defective placentation and endothelial dysfunction are the main pathological features. Lactate dehydrogenase (LDH) is an intracellular enzyme which converts pyruvic acid to lactic acid during glycolysis. Glycolysis is the major energy pathway in placenta. Hypoxia in preeclampsia further increases glycolysis and LDH activity.

LDH gene expression and activity are higher in placentas of PE than normal pregnancy[1-3]. LDH has five isoforms and among this LDHA4 seen in PE is most responsive to hypoxia[4-7]. Elevated levels of LDH indicates cell damage and dysfunction. So it can be used as a biochemical marker as it reflects the severity of the disease, occurrence of complications and fetal outcome. Many authors used elevated total LDH as a diagnostic indicator for hemolysis[8-10]. LDH1 and LDH2 are the 2 isoforms released from red blood cells[11]. We conducted a research to study the role of serum LDH as a prognostic marker in preeclampsia and eclampsia.

Materials and methods

The cases were selected from emergency admissions in labour ward, taken at random, irrespective of age and parity during the period of study(jan2015-dec2015) 100 cases were studied over a period of one year and 100 cases taken as control. Total of 200 cases were studied. The cases were divided into 3 groups on the basis of LDH levels, Group I <600iu/l, Group II 600-800iu/l, Group III >800iu/l.

Data Collection

Data collection tool was used to collect the different information. Face to face interviews were conducted using data collection tool by the investigator including detailed history taking and relevant physical examination.A detailed history was taken from the patient (if the patient was in shock the history was taken retrospectively). All data were collected on a structural data form and analyzed.

Results

In this study of 200 cases, Preeclampsia(PE) and Eclampsia(E) cases were significantly younger, with low gravidity and parity. They had increased systolic and diastolic pressure and liver enzymes uric acid, urine albumin, and LDH when compared to controls. Serum urea and creatinine were normal in majority of cases. Serum Bilirubin, SGOT and SGPT were markedly raised in Preeclampsia(PE) and Eclampsia(E) cases compared to controls. Low platelet count was seen in majority of cases.

The cases were divided into 3 groups on the basis of LDH levels, Group I <600iu/l, Group II 600-800iu/l, Group III >800iu/l. **(Figure-1)** The perinatal mortality were significantly increased in patients with LDH > 800 compared to those with lower levels. Group I (LDH <600iu/l) comprised 80% healthy babies, 13.6% were sick and admitted 6.3%babies were IUD. Group II comprised 50 % babies healthy, 35.7 % were sick and admitted 14.2 % babies were IUD. Group III 29.1% babies healthy, 39.5% were sick and admitted, 33.3% were IUD. **(Figure-2)**

Complications like retinopathy, acute renal failure. Abruptio placenta, DIC, cerebro vascular accidents(CVA), multi organ system failure(MOSF) and shock were also associated with high level of LDH.

Discussion

In the present study, 42 and 58 pregnant women were diagnosed as severe preeclampsia(PE)and eclampsia(E) respectively. 557 cases were diagnosed as mild pregnancy induced hypertension were not included in the study. 89% of women in the study group belongs to less than 30 years of age. 55% of women are primigravida. Ali et al[12] and Demir et al[13] also reported similar data as these are known risk factors. Among 100 women BP>160/110mmHg was found in 42% of cases and all had high LDH values. Uric acid was elevated in 62% of total cases.

Hemoglobin values are less than 10g/dl in 62% of women. Platelet count was less than 1lac/cu mm in 16.6% of PE and 25.8% in eclampsia patients. Increase in liver enzymes SGOT, SGPT were seen in 9.5% of PE and 20.6% in E cases. Lieu et al [14] study showing similar results. In Group III 29.1% babies healthy, 39.5% were sick and admitted, 33.3% were IUD. Qublan et al [15] in his study had found 61.5% of perinatal deaths in group III patients.

Regarding mode of delivery 38% of PE cases and 72.4% Of E cases had undergone caesarean section. Babies weighing less than 2.5 are 28.5% of PE and 63.8% of E cases. IUD cases are 14.2% in PE and 27.5% in E patients.

The main objective of our study was to estimate the serum levels of lactate dehydrogenase. The cases were divided into 3 groups on the basis of LDH levels, Group I <600iu/l, Group II 600-800iu/l, Group III >800iu/l. GroupIII had 37.5% of pre eclampsia and 62.5% of eclampsia cases. All control cases had LDH levels <600. Group III had majority of eclampsia cases. Hence is clearly seen that significant rise in LDH levels associated with severity of the disease. A recent study by Jaiswar et al [16] also reported similar findings.

It is important to analyze the complications as prediction would help in preventing them. In group I except one case of abruption, there were no other complications. In group II 9.5% cases of abruption and 14.2% mild pulmonary edema. In group III Abruption placenta was seen in 4.5 %, acute renal failure 8.3%, pulmonary edema 20.8%, retinopathy 12.5%, DIC 4.1%, multi organ system failure 2.7%, HELLP syndrome was seen in 25%, 8.6% of eclampsia patients died due to multiple complications, DIC, MOSF, sudden and cardiac arrest.

Conclusions

Serum LDH is the very early marker in blood during hypoxia. It is elevated in PE and E. It is a very useful prognostic marker as it predicts the complications of PE and E. The complications are preventable when identified at an early stage and adequately managed at a higher centre. Identification of high levels of LDH needs close monitoring. So the screening of all cases of preeclampsia and eclampsia with LDH should be done.

Figure-1 Classification of study groups on the basis of LDH levels

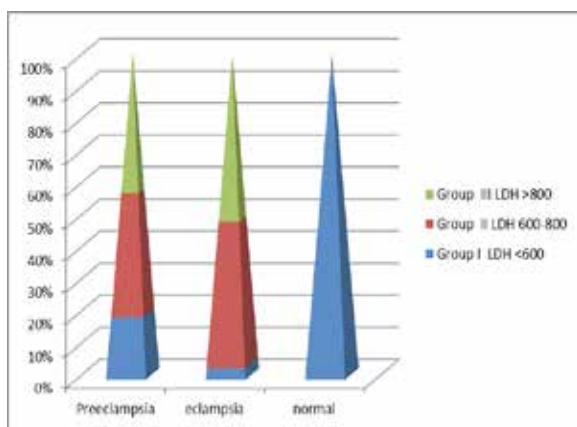
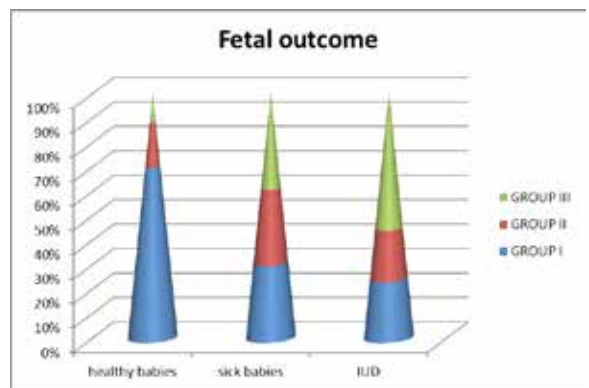


Figure-2 Fetal outcome



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