

Role of Lactic Dehydrogenase as a Biochemical Marker in Hypertensive Pregnant Women [Preeclampsia– Eclampsia]Archana Kumari¹, Anupama²¹Assistant Professor, Department of Obstetrics & Gynaecology, Patna Medical College and Hospital, Patna, Bihar, India²Assistant Professor, Department of Obstetrics & Gynaecology, Patna Medical College and Hospital, Patna, Bihar, India

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Abstract:

Preeclampsia is a disorder of vascular endothelial malfunction and vasospasm that occurs after 20 weeks gestation and can present as late as 4-6 weeks. It is clinically defined by hypertension and proteinuria, with or without pathologic edema. Eclampsia is an acute and life-threatening complication of pregnancy, characterized by the appearance of tonic-clonic seizures, usually in a patient who has developed pre-eclampsia. These, as causes of maternal mortality and morbidity is increasing worldwide both in developed and developing nations, currently the contribution being 15-20%.

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Introduction

Preeclampsia is a disorder of vascular endothelial malfunction and vasospasm that occurs after 20 weeks gestation and can present as late as 4-6 weeks. It is clinically defined by hypertension and proteinuria, with or without pathologic edema. Eclampsia is an acute and life-threatening complication of pregnancy, characterized by the appearance of tonic-clonic seizures, usually in a patient who has developed pre-eclampsia. These, as causes of maternal mortality and morbidity is increasing worldwide both in developed and developing nations, currently the contribution being 15-20%. [1]

Biochemical marker will enable prompt detection of high-risk pregnancy and hence the maternal and fetal outcome can be improved by enhancing the antenatal care to those target women. LDH is an intracellular enzyme that produces energy. It's level increases in these women due to cellular death. So, serum LDH level is a reliable prognostic marker for severity of preeclampsia-eclampsia. [2]

Serum LDH values were seen to correlate with the severity of disease in terms of maternal complications like HELLP, Eclampsia, Abruption, maternal death and fetal complications like IUGR, stillbirth, late IUD. So it's level can be useful in deciding management strategies to improve the maternal and fetal outcome. [3]

The aims of the present study are

- To compare serum LDH levels in the normal

pregnant women and in women with preeclampsia and eclampsia in ante-partum period.

- To correlate the severity of disease with lactate dehydrogenase level in serum of patients of preeclampsia-eclampsia.
- To study the correlation of maternal and perinatal outcomes with serum LDH levels.

Methods

This was a prospective comparative study conducted in the department of Obstetrics and Gynecology in collaboration with the department of Pathology of Patna Medical college and hospital for 1 year.

Pregnant women were enrolled in this study in the third trimester of pregnancy and divided into following groups:

- Group 1—Normotensives (controls)
- Group-2—Hypertensives [patients of preeclampsia and eclampsia] (subjects). This was further subdivided into following subgroups

1. Mild preeclampsia
2. Severe preeclampsia
3. Eclampsia

Subjects were also divided according to the serum LDH levels into following groups:

1. <600 IU/l
2. 600–800 IU/l
3. >800 IU/l

All women were followed until delivery and early postpartum period and babies till early neonatal

period.

Exclusion Criteria

These included mothers with hypertension at <20 weeks gestation; Preexisting diabetes mellitus, renal disease, liver disorder, thyroid disorder, Meningitis, epilepsy, heart disease, hemolysis and other causes of increased LDH.

Results

Total 146 patients were studied, out of which 39 (26.7%) were normal pregnant women which served

as control group; remaining 107 (73.3%) cases included pregnancy with eclampsia and preeclampsia. Out of these 107 cases 35 (32.7%) were mild preeclampsia, 36 (33.6%) were severe preeclampsia and 36 (33.6%) cases were of eclampsia.

The maximum number of patients in control group as well as study group belonged to the age group of 21–30 years. When compared statistically, the age wise distribution in the subjects was almost similar to the control group (*P* = 0.920). Distribution according to parity was similar in both groups (Table 1).

Table 1: Distribution of patients with age and parity

Group	Control	Mild preeclampsia	Severe preeclampsia	Eclampsia	<i>P</i> value
Number	39	35	36	36	
Age (mean)	25.46 ± 3.29	25.80 ± 3.30	26.03 ± 3.99	24.50 ± 3.45	0.929
Parity 0 (no.)	18	24	23	28	0.051

Out of total 58 cases with LDH levels <600 IU/l, 9 (15.52%) had normal SBP, 37 (63.76%) had systolic BP in the range of 140–<160 mm of Hg and 12 (20.69%) had systolic BP 160 and above. Out of 13 patients with LDH levels between 600 and 800 IU/l, 3 (23.08%) had normal systolic BP, 2 (15.38%) had systolic BP in the range of 140–<160 mm of Hg and 8 (61.54%) had SBP 160 or more. In the remaining 36 patients with LDH levels above 800 IU/l, 2 (5.56%) had normal systolic BP, 12 (33.33%) had systolic BP in the range of 140–<160 mm oh Hg and 22 (61.11%) had systolic BP 160 and above.

levels <600 IU/l, 2 (3.45%) had normal diastolic BP, 48 (82.76%) had diastolic BP in the range of 90–<110 mm of Hg and 8 (13.79%) had diastolic BP 110 and above. Out of 13 patients with LDH levels between 600 and 800 IU/l, none had normal diastolic BP, 7 (53.85%) had diastolic BP in the range of 90–<110 mm of Hg and 6 (46.15%) had diastolic BP 110 or more. In the remaining 36 patients with LDH levels above 800 IU/l, 1 (2.78%) had normal diastolic BP, 13 (36.11%) had diastolic BP in the range of 90–<110 mm oh Hg and 22 (61.11%) had diastolic BP 110 and above (Table 2).

On the other hand, out of total 58 cases with LDH

Table 2: Association of systolic and diastolic BP with LDH levels in various groups

Groups	LDH level (mean + SD)	Range	<i>F</i>	<i>P</i>
Control (<i>B</i> = 39)	278.33 + 119.25	90–522	13.744	<0.001
Mid preeclampsia (<i>n</i> = 35)	400.45 + 145.21	93–795		
Severe preeclampsia (<i>n</i> = 36)	646.95 + 401.64	209–1,897		
Eclampsia (<i>n</i> = 36)	1648.10 + 1992.29	214–9,163		
Total	903.16 + 1290.29	93–9,163		

Table 3: Association of systolic and diastolic BP with LDH levels in various groups

Groups	<600 IU/l (<i>n</i> = 58)	600–800 IU/l (<i>n</i> = 13)	>800 IU/l (<i>n</i> = 36)	Total (<i>n</i> = 107)	<i>P</i> value
Systolic BP (mmHg)					
90–<140	9 (15.52%)	3 (23.08%)	2 (5.56%)	14 (13.08%)	
140–<160	37 (63.79%)	2 (15.38%)	12 (33.33%)	51 (47.66%)	
160 and above	12 (20.69%)	8 (61.54%)	23 (61.11%)	42 (39.25%)	<0.001
Diastolic BP (mmHg)					
60–<90	2 (3.45%)	0	1 (2.78%)	3 (2.8%)	
90–<110	48 (82.76%)	7 (53.85%)	13 (36.11%)	68 (63.55%)	
>110	8 (13.79%)	6 (46.15%)	22 (61.11%)	36 (33.64%)	<0.001

When the LDH levels were in the normal range (LDH<600IU) there were no maternal complications. In the second group where LDH levels were moderately elevated (600–800 IU/l) one case of abruption placentae (7.7%) and another case

of cerebrovascular accident (7.7%) was noted. In the third group i.e., with marked elevations of serum LDH levels (>800 IU/l), complications were observed in 8 (22.2%) cases. One case each of abruption placentae, HELLP syndrome with RF,

metabolic encephalopathy, pulmonary embolism, pulmonary edema and renal failure and two cases of cerebrovascular accident were present.

There was statistically significant increase in maternal complications with increasing LDH levels ($P < 0.001$).

Discussion

From our study we concluded that majority of the patients belonged to younger age group and were nulliparous, where the mean age of normal controls was 30 years and those with severe preeclampsia was significantly younger with low parity. Systolic and diastolic BP were significantly higher in patients with higher serum LDH levels ($P < 0.001$) in both studies. [4]

Mean LDH levels in normal controls was 299 ± 79 IU/l, in patients with mild preeclampsia was 348 ± 76 IU/l and in patients with severe preeclampsia was 774 ± 69.61 IU/l. In the present study the LDH levels were significantly raised with the severity of the disease ($P < 0.001$). [5]

Higher serum LDH levels were associated with increased incidence of maternal complications like abruption placenta, renal failure HELLP syndrome, cerebrovascular accidents etc. in the present study. There was a significant increase in maternal morbidity with increasing serum LDH levels ($P < 0.001$). Maternal mortality was 13.8% in patients with LDH levels >800 IU/l and this was a significant rise ($P = 0.006$) which was comparable with other studies. [6]

To conclude LDH levels have significant association with various maternal and fetal outcomes in patients of preeclampsia and eclampsia.

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