ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 04, pp.49334-49336, April, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

LACTATE DEHYDROGENASE A BIOCHEMICAL MARKER IN ASSESSING THE SEVERITY OF PREECLAMPSIA

***Dr. N. K. Mahalakshmi**

M.D DGO, India

ARTICLE INFO

Article History:
Received 14th January, 2017
Received in revised form
17th February, 2017
Accepted 05th March, 2017
Published online 30th April, 2017

Key words:
Lactic, Dehydrogenase, Preeclampsia, Eclampsia, Maternal outcome.

ABSTRACT

Objectives: To correlate the severity of the disease, maternal and perinatal outcome with Lactic Dehydrogenase levels in serum in patients of preeclampsia and eclampsia.
Methods: A prospective comparative study was conducted in department of Obstetrics and Gynaecology in Govt Rajaji Hospital, Madurai. Out of 150 women studied, 75 women were normal pregnant women, 28 women were non severe preeclampsia, 27 cases were severe preeclampsia and 20 cases were eclampsia. The statistical analysis was done by chi square test analysis of variance and sample "t" test.
Results: 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.
Conclusion: High Serum LDH levels correlate well with the severity of the disease and poor outcomes in patients of preeclampsia and eclampsia.

Citation: Dr. N. K. Mahalakshmi, 2017. "Lactate dehydrogenase a biochemical marker in assessing the severity of preeclampsia", *International Journal of Current Research*, 9, (04), 49334-49336.

INTRODUCTION

Preeclampsia and eclampsia complicates 6- 8% of all pregnancies thereby leading to various maternal and fetal complications. These are multisystem disorder and leads to cellular death. LDH is an intracellular enzyme and its level is increased in these women by cellular death. Thereby serum LDH levels can be used for the assessment of extent of cellular death and thereby the severity of disease in these patient. This can be further used in decision making regarding the management strategies to improve the maternal and fetal outcome.

Aim of the Study

To compare the serum LDH levels in normal pregnant women and in women with Preeclampsia and eclampsia in antepartum period. To study the correlation of maternal and perinatal outcomes with serum LDH level.

MATERIALS AND METHOD

This was a prospective comparative study conducted in Department of Obstetrics and Gynaecology Govt. Rajaji Hospital, Madurai from Sep 2015 to Aug 2016. 150 Women were included in the study which had 75 Controls and 75 cases of Pre-eclampsia and eclampsia

Inclusion Criteria

Pregnant women enclosed in this study in third trimester of pregnancy are divided into following groups,

Group 1 : Healthy normal pregnant women in third trimester of pregnancy (control)

Group 2: Patients with preeclampsia and eclampsia (subjects). This was further subdivided into following subgroups

- Non severe preeclampsia
- Severe preeclampsia
- Eclampsia

All women were be followed up for complications until delivery and early postpartum period and babies till early Neonatal period.

Exclusion Criteria

Mothers with hypertension at or < 20 weeks gestation, Preexisting DM, preexisting renal disease, preexisting liver

Corresponding author: Mahalakshmi,
M.D DGO, India.

disease, thyroid disorders, epileptic disorder and h/o hyperuricemia.

RESULTS

Total 150 patients were studied ,out of which 75 (50%) were normal pregnant women which served as a control group; remaining 75 (75%) cases included pregnancy with eclampsia and preeclampsia. Out of these 75 cases 28(19%) were non severe preeclampsia, 27 (18%) were severe preeclampsia and 20 (13%) cases were of eclampsia.

LDH level in various groups

LDH	Control	Non severe	Severe	Eclampsia
Mean	190.24	392.7	630.44	919.2
SD	72.53	138.8	126.7	369.1
p value	< 0.001 Sig			

LDH	< 600 (37)	600 - 800 (17)	> 800 (21)
Non severe (28)	25 (89%)	3 (11%)	0
Severe (27)	11 (40.7%)	12 (44.4%)	4 (14.9%)
Eclampsia (20)	1 (5%)	2 (10%)	17 (85%)
Normal (75)	75 (100%)		

In the control all 75 had LDH (<600 group), Mean value of LDH among control is 190.24 $\pm$ 72.53. Most of the patients in NSP (89%) had LDH level < 600. Mean LDH - 392.7 + 138.8. Only 3 patients (11%) of NSP had LDH level 600-800 group. Among 27 cases of Severe preeclampsia, 12 cases (44.4%) had LDH 600 – 800 group, 11 cases (40.7%) had LDH < 600 group. 4 cases (14.9%) had LDH > 800 group. Out of 20 cases of eclampsia, 17 cases(85%) had LDH > 800, 2 cases(10%) had LDH 600 – 800, 1case(5%) had LDH < 600. On analyzing the above data it is clearly observed that there is significant risein LDH levels with increasing severity of disease (p<0.001).

Association of systolic and diastolic bp with ldh levels in various groups

Systolic BP	< 600 (112)	600 - 800 (17)	> 800 (21)
< 150 (105)	101	4	0
>/= 150 (45)	11	13	21

Out of 112 cases with LDH < 600 group, 101 had SBP < 150 group and 11 had SBP >/= 150 group. Out of 17 patients with LDH 600 – 800 group 4 had SBP < 150 group and 13 had SBP >/= 150 group Out of 21 patients with LDH > 800 group 21 (100%) had SBP >/= 150 group.

Diastolic BP	< 600 (112)	600 - 800 (17)	> 800 (21)
< 110 (116)	106	4	6
>/= 110 (34)	6	13	15

Out of 112 cases with diastolic BP < 600, 106 had diastolic BP < 110 and 6 DBP >/= 110. Out of 17 cases with DBP 600 – 800, 4 had DBP < 110 and 13 had DBP > 110. Out of 21 cases with DBP > 800, 6 had DBP < 110 and 15 had DBP > 110. On statistical analysis, it was found that high systolic and diastolic BP were associated with higher level of LDH (p value <0.001 significant)

Association between ldh and birth weight

Birth weight / LDH	< 600 (120)	600 - 800 (10)	> 800 (20)
< 2.5 kgs (60)	33 (27%)	8 (80%)	19 (95%)
> 2.5 kgs (90)	87 (73%)	2 (20%)	1 (5%)

It was found that in cases with LDH <600IU/L, 73% babies had birth weight > 2.5 kg. when LDH was between 600-800 IU/L 20 % babies had birth weight > 2.5 kg and when LDH > 800IU/L only 5% babies had birth weight >2.5 kg. This observation indicates reduction in the birth weight of babies with higher LDH levels (p <0.001).

Association of Ldh and Perinatal Outcome

	< 600 (112)	600 - 800 (17)	> 800 (21)
Healthy baby	107	13	4
Sick baby	5	3	12
SVD / IUD	0	1	5

LDH > 800 IU/L - Totally 21 babies were born to mother with LDH> 800 of which 5 babies (23.80%) were IUD. 57.14% cases expired and 19.04% were healthy babies. LDH 600 -800 IU/L- 76.47% of healthy babies, 17.64% babies expired and 5.88% were IUD. LDH >800IU/L 95.53% of healthy babies, 4.46 % babies expired and there were no IUD. The occurrence of neonatal complications (p=0.003), still births (p< 0.001) and perinatal deaths (p=0.003) were significantly higher in mothers who had increased levels of LDH.

Association of ldh and occurrence of maternal complications

	< 600	600 – 800	> 800
HELLP		2(11.76%)	5(23.8%)
Abruption / DIC		2(11.76%)	2(9.52%)
MODS		1(5.88%)	3(14.28%)
Macular edema		1(5.88%)	
CVA / PRES			6(28.5%)
Retinopathy	1(0.89%)		2(9.52%)
AKI			1(4.76%)
Mild PHT		1(5.88%)	

In cases with LDH> 800, HELLP was found in 23.8% cases, PRES in about 28.5% cases, MODS in 14.28% cases, DIC and retinopathy contributing 9.52% each and AKI in 4.76 % cases. In cases with LDH 600-800, HELLP and abruption found in11.76% cases each, MODS, macular edema and mild PHT in 5.88% cases each. In cases with LDH < 600, Retinopathy was found in 0.89% cases. There was statistically significant increase in maternal complications with increasing LDH levels (p< 0.001).

DISCUSSION

It is well understood that hypertensive disorders of pregnancy are most commonly in association with high risk factors and they are associated with changes in certain hematological parameter (Craici *et al*., 2008). LDH> 600 IU/L seen in 11% of NSP, 16% SP, 10% of eclampsia cases. P value is <0.001. This was found to be statistically significant. "Demir *et al* had found that in complicated cases of PE and eclampsia (BurdLi and Simmons, l975). LDH level was significantly higher (Tsoi *et al*., 2001). It was found that in all normal or cases taken as control, had LDH < 600. Group II with LDH > 600 had PE and Eclampsia cases and no normal cases. Group III LDH > 800 had majority of eclampsia cases. Thus it clearly seen that there is significant rise in LDH levels with increasing severity of disease. A recent study conducted by Jaiswae *et al* also reported similar findings. If we look at Perinatal outcome according to LDH level, it was observed that there was

significant association of low birth weight and perinatal mortality with increasing LDH levels (Cunningham *et al*., 2010) "Qubian *et al*. in his study also found that 61.5% of perinatal death were found in cases having LDH level > 800 IU/L. On analyzing the maternal complications further according to LDH levelMaternal complications were significantly increased in women with increasing LDH levels. "Quablan *et al*. in his study found that maternal complications were more in patients with LDH > 800. However still researches are needed in this field. LDH –A (Kay *et al*., 2007) isoenzyme activity (Macken *et al*., 1975) measurement would be more specific in cases of preeclampsia. Measurement of liver function test in addition would predict cases better. Kozic *et al* in his study proved that adverse maternal outcomes are common in cases with abnormal LDH, AST, ALT, Total bilirubin, and INR resuts and hence LFT and LDH should be studied in all cases of preeclampsia and eclampsia.

Conclusion

Thus serum LDH is the earliest marker in blood in conditions associated with hypoxia & oxidative stress. Thereby it is raised in Preeclampsia & Eclampsia (Kay 1-Ill *et al*., 2007). "It predicts the severity & occurrence of complications in Pre-Eclampsia & Eclampsia. The complications can be prevented if it is measured earlier, if adequately managed at a higher center." "Detection of high risk pregnancies with increased level of LDH requires close monitoring in antenatal period & proper management is necessary (Bougnerea *et al*., 1995). This will help to a greater reduction in maternal and fetal morbidity and mortality. Hence we conclude that screening with is essential for all cases of Preeclampsia and Eclampsia is essential for early detection and management."

REFERENCES

Bougnerea PP. Rocoh F, Nurjhan N, *et al* Stable isotope 14 All BS Severe pre-eclampaia and determination of plasma lactate conversion into glucose in fasting infants. *Am J Physiol*., 1995; 268:E652-800.

BurdLi, Simmons MA. Makowski Et/6t at Placental production and foetal utilization of lactate and pym) *Nature*, l975;254:710-1.

Craici I, Wagner S, Garovic VD. Pre-eclainpaia and future car-diovascujar risk: formal risk factor or failed, stress test?, *Ther Adv Cardiovasc Dis*., 2008;2(4):249—59.

Cunningham, F.C., Leveno, 10, Bloom SL, *et al*. Williams obstet rics. 23rd ed. New York: McGraw-Hill; 2010. p. 706.

Kay 1-Ill, Thu 5, Tsoi S. Hypoxia and lactate production in tro *phoblast cells. Placenta*. 2007;28(8-9j854-60.

Macken CL, Shaklee JE, Whitt OS. Evolution of a gene: multiple genes for LDH isozymes provide a model of the evolution of gene structure, function and regulation. *Science*, 1975;189:102-500.

Tsoi SCM, Zheng J, Xu F, *et al*. Differential expression of lactate dehydrogenase isozymes (LOll) in human placenta with high expression of LDH-A4 isozyme in the endothelial cells of pre eclampsia villi. *Placenta*, 2001; 22(3 17):22.

****