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Research Article

**SERUM LACTATE DEHYDROGENASE: A BIOCHEMICAL
MARKER IN PREECLAMPSIA AND ECLAMPSIA**¹Sara Ahmad, ²Khadija Naseer khan, ³Hanan Akram¹Sheikh Zayed Medical College and Hospital, Rahim Yar Khan, saraahmad14330@gmail.com²Tehsil Head Quarter Hospital Shakargarh, Narowal, khadija_naseer@yahoo.com³Tehsil Headquarter Hospital Daska, District Sialkot, hananakramcheema@gmail.com**Abstract:**

Background Discussion: With the involvement of different systems, a disease of hypertensive during pregnancy is Preeclampsia. LDH is released in plasma in the above-mentioned disease. The reason of LDH is hypoxia and there is also break down of various cells in different organ systems. Disease will be severe when the amount of the serum of released LDH. This will also be the sign of cellular death. The objective of this examination is to study the relationship of amount of LDH which is gradually increasing and the severity of the disease Preeclampsia.

Materials and Techniques: This paper is based on an examination and hypothetical study. At Jannah Hospital, Lahore, the above study is conducted. The number of women that is enlisted in the following study for performing the experiment is 240. The study is conducted from May 2015 to June 2018. The group of total 240 women is further divided into two categories of a group of 120 women. The first category is of normal pregnant women and the second group is of the women that is the patient of Preeclampsia during pregnancy. With the help of biochemical automated analyzer, the amount of released LDH is measured. The second group of 120 women which are patient of Preeclampsia is divided into the further two groups on the basis of the amount of released LDH serum. The following study is included the period until the delivery phase. SPSS is used for the statistical and factual calculations and measurements.

Findings: With the comparison of the group of normal patients of 120, the study observed that the amount of LDH serum is significantly high in the group of affected groups of people. And the disease of Preeclampsia will be more severe in that patients.

Conclusion: The break down of cells in different organ systems is increased by the increased amount of the released amount of serum of LDH. So, the severity of the disease is also increased.

Index Terms: Lactate dehydrogenase (LDH); Preeclampsia; Hypertension

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INTRODUCTION:

A disease of hypertensive with the involvement of different systems during pregnancy is Preeclampsia. The complications during the period of pregnancy is increased due to the hypertension 1. In overall world, 8-11% of pregnancies are affected by drastic Preeclampsia and this range varies from 9-12% in Pakistan. Pathophysiology of Preeclampsia is really very complex. The center highlights of preeclampsia are the blemished placentation. Endothelial brokenness is also viewed as the reason of the Preeclampsia 3, 5. In the total cases of 10000 people, 6.4 percent people is affected by Preeclampsia and also eclampsia 5. By diagnosing Preeclampsia at early stage, its rate of mortality can be decreased to a significant range. All the significant organ frameworks for example kidney, erythrocytes and heart has the enzymes called as LDH. Pyruvic acid is converted into the lactic acid by that enzyme which is intracellular. Its high amount shows the break-down of cells and its entry in the serum 6. LDH is released in the plasma. The reason of that process is hypoxia and the number of the damaged cells in different organ systems 7. The break-down of cells in many organ systems is exponentially increased by the increased amount of the excreted amount of serum of LDH. So, the severity of the Preeclampsia is also increased. The test which is done to measure the level of LDH serum is really very common and cost effective. In the most developed countries, this factor will be very useful which making the decisions about the techniques to manage and the betterment of the strategies adopted by the management to control the Preeclampsia. A huge number of studies is present on the topic of the relationship of the level of LDH serum and the extent of Preeclampsia. This paper presents and evaluates the gradually increasing disease of Preeclampsia and it also discussed the connection of the LDH and the severity of the above-mentioned disease Preeclampsia.

MATERIALS AND TECHNIQUES:

The presented article is based on an experiment and hypothetical study. At Jannah Hospital, Lahore, the following study is directed. The total number of women enlisted in the following study for performing the experiment regarding Preeclampsia is two hundred and forty. The age group of that women ranges from 18 to 35 years. The gestational age of all the women which are pregnant also had singleton pregnancy is greater than twenty-eight weeks. These women kept in the ward called as OBG ward and they also attended OBG OPD. Another point which is involved in the study is labor room.

Women which are affected by some other diseases such as diabetes mellitus, disorder of thyroid, infection the traction of urine and epilepsy is not considered which conducting the experiment. The women which are patient of hypertension and their gestational week is less than twenty is also not present in the following study. The detailed information about that women and the consent in the written form is taken out by ager. The selected patients are selected by the criteria of inclusion and also exclusion. The above study is led from May 2015 to June 2018. Total 240 women is further separated into two classes.

Each class contains 120 women. The first class is of pregnant women which are normal and the second collection is of that women that is affected by Preeclampsia during their pregnancy period. With the help of automated analyzer, the amount of released LDH is observed and calculated. The second set of 120 women which are persevering Preeclampsia is alienated into the further two sets on the origin of the amount of released LDH serum. The resulting study is comprised the period until the delivery phase. SPSS is the software used for the statistical and factual designs and measurements.

Findings:

In between the age of 19 and 32 years, Ladies of both the gatherings were of tantamount age. The range of the systolic BP varies around 108.67 ± 10.22 mmHg and the range of the diastolic BP differs around the number of 69 ± 5.01 mmHg. With expanding seriousness of PE, in the examination bunch, there is factually significant increment in systolic and diastolic BP. From that 120 women which are affected by the Preeclampsia, the women which are not severely affected are 78 and the women which are severely affected are 48 in number. The systolic Bp of that group of women which are less affected by Preeclampsia is 139.98 ± 5.00 mmHg and the value of the diastolic BP is 96.45 ± 16.95 mmHg. The group of the patients which are severely affected by the disease has the systolic BP of the value 169.96 ± 12.01 mmHg and the value of the diastolic BP of that women was 112.99 ± 5.56 mmHg. The level of LDH released serum for everyone of the controls is less than 600. In the present experiment, the amount of LDH is less than 600 for 68 classes of the patients, while 36 women from them has the amount of the LDH serum in between 500 and 800. 17 number of patients has the level greater than 800 (Table 1).

Table 1. In the study group, Spreading of many patients with various severity of preeclampsia and eclampsia according to levels of LDH:

Level of S. LDH (IU/L)	patients without severity of feature (n = 70)	patients with severity of feature (n = 40)	Eclampsia (n = 9)	Value of p*
< 600	56	10	2	0.0011
600-800	13	21	1	
> 800	2	10	5	

The normal patients have less amount of LDH released serum while the affected people have the higher level of LDH serum. The difference between normal and affected people is considerably high. The average value of the LDH serum in the normal pregnant women is 219.81 ± 87.12 IU/L. while this value for that women who has the disease but at a low level is 500.02 ± 161.34 IU/L. The women with severe condition have the value of the level of the LDH is 950.22 ± 511.12 IU/L. It is clearly concluded from the results that the condition of the patient will be severe with the increased level of the serum LDH.

In the following group of study, it is observed that by increasing the level of LDH the value of the both systolic and diastolic blood pressure significantly raised (Table 2).

Table 2. Avg value of both SBP and DBP in three subcategories of level of serum LDH in the patients of PE

S LDH	<600 (no = 70)	600-800 (no = 33)	>800 (no = 19)	Value of p*
SBP	150.86 ± 9.87	157.19 ± 12.2	174.77 ± 19.54	0.0011
DBP	95.56 ± 14.65	106.18 ± 18.42	112.22 ± 11.1	0.0011

In the total group under examination, it is also concluded that the patients with the greater amount of the serum LDH, the amount of the proteinuria in that patients will also be much higher than others. 1+ value of proteinuria is present in the people having the level of LDH is equal to 600. The percentage of that patients are 72 percent. Only the percentage of 1.5 has 3+ proteinuria and the level of LDH in them is also less than 600 (Table 3).

Table 3: Spreading of patients according to value of proteinuria in three subcategories of levels of serum LDH

proteins	LDH (IU/L)			Value of p*
	LDH <600	600-800	>800	
1+	49	15	6	0.001
2+	18	9	5	
3+	1	11	6	

Eclampsia, puerperal sepsis and many other complications of parental is just present in the patients of the above-discussed disease. These are not present in any other woman. In the group of 13 people, 11 happened the people affected by the disease while just 2 from them is in control. So, it is shown that the parental complications also raised exponentially with the increase in the amount of the LDH (Table 4).

Table 4. Relationship between the parental problems with increased level of LDH serum

Parental Problems	LDH (IU/L)			Value of p*
	<600	600-800	>800	
APH	1	2	3	0.0011
Eclampsia	2	1	5	
HELLP	0	0	1	
PPH	2	4	5	
ICU Admission	0	1	0	
Puerperal Sepsis	0	0	1	
No problems	63	27	2	

Eclampsia, puerperal sepsis and many other difficulties of parental is just present in the patients who had the significant amount of the serum called as LDH and this level greater than 800. Another factor which is observed is this the amount of the deliveries of preterm is also much increased in the people which are affected by Preeclampsia as compared to the controlled patients. The patients with the increased amount of serum also rarely give birth to the average weighted babies. The value of the NICU admission is also significantly increased with the increased level of the serum as compared to the people who had less amount of LDH.

Table 5: Relationship of level of serum with the blood pressure by different researchers

LDH	By experiment	Qublan HS et al ⁶	Y. Umasaty asri et al ⁸	Pratibha Agrawal et al ⁹	Vinita et al ¹⁰
Normotensive	219.27 ± 86.13	300 ± 97	159.36 ± 42.89	393.04 ± 10.8	322 ± 48
Controlled patients	495.3 ± 156.4	348 ± 67	322.20 ± 77.30	533.5 ± 24.05	488 ± 76
More Affected patient	957.3 ± 510.04	774.9 ± 69.6	633.10 ± 132.19	932.1 ± 516.1	755 ± 77
Value of p	0.0011	< 0.0011.	< 0.0011	<0.00111	<0.0011

There was a significant increment in albuminuria with the expanding seriousness of PE. In our investigation we found that ladies in control bunch had no proteinuria aside from 7.6% ladies who had proteinuria in follows. In patients of PE without serious component, 67.04% ladies had pee egg whites 1+, 24.6% ladies had 2+ and 6.5% ladies had 3+. While in patients with serious highlights of PE, 41.7% ladies had pee egg whites 1+, 32.3% had 2+ and 28.1% had 3+. This was steady with the investigations done by Qublan HS et al⁶ and Vinita PM et al.¹⁰ We additionally watched significantly more proteinuria in patients who had more elevated level of serum LDH (p esteem 0.001) as appeared in Table-3. This relationship may be a direct result of patients with higher serum LDH level had higher systolic and diastolic BP.

In our investigation we saw that review bunch had progressively Cesarean area 42.07% and initiated conveyance 28.5% than control gathering. This difference was factually significant. This is as per the examination directed by Jyoti Hak et al¹¹ and Urvashi Sharma et al¹². Jyoti Hak et al¹¹ had watched 29% Cesarean area in cases when contrasted with 16% in controls and 48.5% actuated conveyance in cases when contrasted with 31% in control gathering.

DISCUSSION:

An experiment is performed on a group of 240 women in the present study.

- Group # 01: total 120 women who had no disease such as preeclampsia
- Group # 02: 120 women who are the patient of pre-eclampsia

The main observation from the experiment is that the level of the serum named as LDH is significantly incremented with the complexity of the disease. This is also observed in some other studies 6 (Table 5).

It is seen that caesarean section and deliveries of induced vaginal increased with the rising level of the LDH in the patients of the preeclampsia by the study. In the previous studies of the different authors, by comparison, it can be seen that there is no much difference in the deliveries of the patients and controlled people. It is factually indicated that the parental problems also increased to a higher level with the increase in the level of the LDH serum. The detailed information regarding this discussion is explained in the tables. Qublan et al⁶ additionally announced 92.3% patients of LDH>800 had different maternal confusions when contrasted with 4.7% in patients LDH between 600-800IU/L. Martin et al¹³, Umasatyasri et al⁸ and Hemalatha K R et al¹⁴ likewise found more significant level of LDH related with significant high maternal mortality and horribleness. In our examination increasingly number of preterm conveyances happened in cases (35.0%) than control gathering (26.7%) which was measurably significant. We additionally saw that more preterm conveyances happened with expanding level of LDH. This was steady with the Vinita PM et al¹⁰ and Umasatyasri Y et al⁸ examines. They watched more preterm conveyances with the higher serum LDH levels.

It was likewise seen that number of low birth weight

babies had significant relationship with the rising serum LDH level. In any case, Qublan HS et al⁶ and Vinitha PM et al¹⁰ examines didn't watch significant differences in birth weight with the rising degrees of LDH. We saw that there was significant relationship between prerequisite of NICU confirmation with expanding level of serum LDH which can be credited to progressively number of low birth weight and low Apgar score babies.

CONCLUSION:

In our imminent observational investigation on correlation of serum LDH levels in normotensive controls and patients with preeclampsia. We inferred that serum LDH levels are significantly brought up in preeclampsia when contrasted with controls. Levels of serum LDH increment with expanding seriousness of preeclampsia and this was factually significant. Rising degrees of serum LDH were related with expanding maternal complexities.

Limitations:

The investigation was directed in a solitary focus which probably won't be a delegate of entire populace as we had chosen just 240 patients out of which 120 were normotensive controls. Little example size could influence the outcomes. There could be varieties as indicated by the geographic and racial components.

REFERENCES:

- American College of Obstetricians and Gynecologists; Task Force on Hypertension in Pregnancy. Hypertension in pregnancy. Report of the American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy. *Obstet Gynecol* 2013; 122(5):1122-31.
- Gohil JT, Patel PK, Gupta P. Estimation of lipid profile in subjects of preeclampsia. *J Obstet Gynaecol India* 2011; 61(4):399-403.
- Park K. Preventative medicine in obstetrics, pediatrics and geriatrics. In: Park k. (eds). Park's textbook of preventive and social medicine, 21st ed. M/S banarasidas Bhanot publisher; 2011. p. 514-7.
- Adu-Bonsaffoh K, Obed SA, Seffah JD. Maternal outcomes of hypertensive disorders in pregnancy at Korle Bu Teaching Hospital, Ghana. *Int J Gynaecol Obstet* 2014; 127(3):238-42.
- MacKay AP, Berg CJ, Atrash HK. Pregnancy-related mortality from preeclampsia and eclampsia. *Obstet Gynecol* 2001; 97(4):533-8.
- Qublan HS, Ammarin V, Bataineh O, Al-Shraideh Z, Tahat Y, Awamleh I, Khreisat B, Nussair B, Amarin ZO. Lactic dehydrogenase as a biochemical marker of adverse pregnancy outcome in severe pre-eclampsia. *Med Sci Monit* 2005; 11(8):CR393-7.
- Dave A, Maru L, Jain A. LDH (Lactate Dehydrogenase): A Biochemical Marker for the Prediction of Adverse Outcomes in Preeclampsia and Eclampsia. *J Obstet Gynaecol India* 2016; 66(1):23-9.
- Y Umasatyasri, I Vani, P Shamita. Role of LDH (Lactate dehydrogenase) in preeclampsia as a prognostic marker: An observational study. *IAIM* 2015; 2(9): 88-93.
- Agrawal P, Rajoria L, Vyas J, Savli A, Balsane R, Gupta S. Serum LDH in Preeclampsia & Eclampsia and Maternal Outcomes. *SJAMS* 2016; 4(6C):2052-5.
- PM Vinitha, Chellatamizh M, Padmanaban S. Role of serum LDH in preeclampsia as a prognostic factor – a cross sectional case control study in tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol* 2017; 6(2): 595-8.
- Hak J, Nisa N, Gupta S. LDH Levels in Pregnancy and its Association with Severity of the Disease and Feto- maternal Outcome in Preeclampsia and Eclampsia. *JK Science* 2015; 17(3): 110-3.
- Sharma U, Hariharan C. Maternal outcome in PIH Patients in Relation with Serum LDH Levels. *IOSR-JDMS* 2017; 16(1): 1-4.
- Martin J N Jr, May W L, Magann E F. Early risk assessment of severe preeclampsia. Admission battery of symptoms and laboratory test to predict the likelihood of subsequent significant maternal morbidity. *Am J Obstet Gynaecol* 1999, 180:1407-14.
- K. R. Hemalatha, K Sahaja. Serum Lactate Dehydrogenase as a prognostic marker in preeclampsia and eclampsia. *IJOGR* 2018; 5(1):31-6.