

Content available at: <https://www.ipinnovative.com/open-access-journals>

Indian Journal of Obstetrics and Gynecology Research

Journal homepage: [www.ijogr.org](http://www.ijogr.org)

## Original Research Article

## To study the role of serum lactate dehydrogenase in prediction of adverse outcomes of pre-eclampsia and eclampsia

Susmita Mukhopadhyay<sup>1,\*</sup>, Neeta Natu<sup>1</sup>, Khushboo Anand<sup>1</sup><sup>1</sup>Dept. of Obstetrics and Gynecology, Sri Aurobindo Institute of Medical Sciences, Indore, Madhya Pradesh, India

## ARTICLE INFO

## Article history:

Received 07-09-2021

Accepted 23-09-2021

Available online 14-02-2022

## Keywords:

Serum lactate

Dehydrogenase

Pre-eclampsia &amp; eclampsia

## ABSTRACT

**Background & Method:** The present study was carried out in the Department of Obstetrics and Gynaecology, with an aim to study the role of Serum Lactate Dehydrogenase in prediction of adverse outcomes of pre-eclampsia and eclampsia. The patients were selected from patients who were admitted to as emergency cases in labour room patients were irrespective of age and parity. On a specially designed proforma for this study, the patient particulars like detailed obstetric history, examination and laboratory findings were studied.

**Result:** Among the cases studied 76% preeclampsia and 96% eclampsia patient were unbooked case and most of them resided in rural areas while the remaining were from urban slums. Hyperbilirubinemia was seen in small groups of pre-eclampsia and eclampsia patients. Deranged level of liver enzyme were also found in small group of pre-eclampsia and eclampsia patients. LDH level was found significant higher (more than 600 IU/L) in pre-eclampsia and eclampsia patients.

**Conclusion:** Eclampsia is associated with significant maternal and perinatal morbidity and mortality. The higher mortality is due to high percentage of the patient being unbooked and majority received no therapeutic intervention until admission. Among the cases studied 76% preeclampsia and 96% eclampsia patient were unbooked case and most of them resided in rural areas while the remaining were from urban slums. Hyperbilirubinemia was seen in small groups of pre-eclampsia and eclampsia patients. Deranged level of liver enzyme were also found in small group of pre-eclampsia and eclampsia patients. LDH level was found significant higher (more than 600 IU/L) in pre-eclampsia and eclampsia patients.

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: [reprint@ipinnovative.com](mailto:reprint@ipinnovative.com)

## 1. Introduction

A modest amount of all pregnancies are convoluted by hypertension. Eclampsia and toxemia represent about portion of these cases worldwide and have been perceived and portrayed for quite a long time in spite of the overall absence of comprehension of the disease.<sup>1</sup> In the fifth century, Hippocrates noticed that migraines, spasms, and tiredness were inauspicious signs related with pregnancy. In 1619, Varandaeus begat the term eclampsia in a composition on gynecology.<sup>1,2</sup>

Eclampsia, which is viewed as a complexity of serious toxemia, is normally characterized as new beginning of amazing mal seizure movement or potentially unexplained unconsciousness during pregnancy or post pregnancy in a lady with signs or manifestations of preeclampsia.<sup>3</sup> It commonly happens during or after the twentieth seven day stretch of incubation or in the post pregnancy time frame. Regardless, eclampsia without hypertension with proteinuria has been shown to happen in 38% of cases announced in the United Kingdom.<sup>3</sup> Similarly, hypertension was missing in 16% of cases investigated in the United States.<sup>4</sup>

\* Corresponding author.

E-mail address: [sushm20032003@yahoo.com](mailto:sushm20032003@yahoo.com) (S. Mukhopadhyay).

The clinical signs of maternal toxemia are hypertension and proteinuria with or without existing together fundamental irregularities including the kidneys, liver, or blood. There is additionally a fetal appearance of toxemia including fetal development limitation, decreased amniotic liquid, and unusual fetal oxygenation.<sup>3</sup> HELLP condition is an extreme type of toxemia and includes hemolytic iron deficiency, raised liver capacity tests (LFTs), and low platelet tally.

Most instances of eclampsia present in the third trimester of pregnancy, with about 80% of eclamptic seizures happening intrapartum or inside the initial 48 hours following conveyance. Uncommon cases have been accounted for before 20 weeks' incubation or as late as 23 days' post pregnancy. Other than early discovery of toxemia, no solid test or manifestation complex predicts the improvement of eclampsia. In created nations, many announced cases have been delegated inevitable.

Hereditary inclination, immunology, endocrinology, nourishment, unusual trophoblastic attack, coagulation irregularities, vascular endothelial harm, cardiovascular maladaptation, dietary lacks or overabundance, and disease have been proposed as etiologic elements for toxemia/eclampsia.<sup>5</sup> Imbalanced prostanoid creation and expanded plasma antiphospholipids have additionally been involved in eclampsia.<sup>2,6</sup>

## 2. Materials and Methods

The present study was carried out in the Department of Obstetrics and Gynaecology, it is a prospective study.

The patients were selected from patients who were admitted to as emergency cases in labour room patients were irrespective of age and parity. On a specially designed proforma for this study, the patient particulars like detailed obstetric history, examination and laboratory findings were recorded; were studied.

### 2.1. Method

1. Blood pressure recording: Blood pressure was recorded in lateral recurrent position. The point of muffing of Korotkoff's sound was taken as diastolic pressure when the sound failed to disappear till zero, otherwise the point of disappearance of Korotkoff's sound was taken as diastolic BP. At least two recording six hours apart were taken.
2. Family history of PIH - All possible effects were made to get a detailed family history as regards to affected sisters, mothers and mother in-law and most of the data is based on the verbal account given by the patient or attendants.
3. Proteinuria - A test tube was two third filled with a midstream sample of urine. The top 2 cm of the urine was boiled over a flame. Turbidity of urine which did

not disappear even on addition of 10% acetic acid was considered to be indication of proteinuria. For practical purposes the amount of protein was exposed as a haze (+), cloud (++) or granular precipitate (+++).

### 2.2. Inclusion criteria

1. All cases of pre eclampsia and eclampsia admitted in the Department of Obstetrics & Gynaecology.
2. All proven cases of eclampsia (Hypertension, albumin and convulsion
3. All the cases of imminent eclampsia.

### 2.3. Exclusion criteria

1. Known case of epilepsy.
2. Convulsion occurring as a complication of uremia.
3. Convulsion or coma due to cerebral disease, eg Encephalitis, meningitis, cysticercosis, ruptured cerebral Aneurysm.

### 2.4. Study designed

Observational study.

## 3. Results & Discussion

Incidence of eclampsia varies from country to country. In general eclampsia is preventable and it less common in the developed countries (UK, USA) of 11625, 120 and 260 patients were diagnosed as preeclampsia and eclampsia respectively. This indicates a frequency of 1.03% for preeclampsia and 2.23% for eclampsia.

Swains et al reported the incidence of eclampsia as 2.2% of all hospital deliveries.<sup>7</sup> Choudhary P (mid April 2000 to mid April 2001) in a retrospective study observed the incidence of eclampsia as 2.9 per 1000 deliveries.<sup>8</sup>

Dr. Tayyiba Wasim et al. reported the incidence of eclampsia at Lahore General Hospital (2002) as 2.2%.<sup>9</sup> In our study it is found that that serum Lactate Dehydrogenase were > 600 IU/L in 77.50% of Preeclampsia and 78.46% of eclampsia patients.

Demir et al. (2006)<sup>10</sup> had found that in complicated cases of Preeclampsia and eclampsia, LDH level were significantly higher. Qublan HS et al. (2005)<sup>11</sup> had found abnormally that LDH as a biochemical marker of adverse pregnancy outcome in severe Preeclampsia patients.

LDH level > 600 IU/L in 54.8% of severe Preeclampsia and 12.2% of mildly Preeclampsia. Lactate dehydrogenase is a useful marker that reflect the severity of and occurrence of complication of preeclampsia. Sever preeclampsia is frequently accompanied by evidence of hemolysis, which is semiquantified. By elevated serum lactate dehydrogenase levels.

Rinehart reported the rate of change of platelet count and LDH level in preeclampsia for LDH, values increased at a

**Table 1:** Distribution of cases according to diagnosis

Diagnosis on admission	No. of Cases	Percent	No. of Death	Percentage mortality
Preeclampsia	120	31.58	12	12
Eclampsia	260	68.42	23	8.84
<b>Total</b>	<b>380</b>	<b>100%</b>	<b>35</b>	<b>9.21%</b>

**Table 2:** Distribution of pre-eclampsia & eclampsia in relation to Booked/Unbooked status

Status	Preeclampsia (N=120)				Eclampsia (N=260)			
	No.	%	Death	Percentage mortality	No.	%	Death	Percentage mortality
Booked	28	23.33	1	3.57	13	5	1	7.69
Un-booked	92	76	11	11.95	247	95	22	8.90
<b>Total</b>	<b>120</b>	<b>100%</b>	<b>12</b>	<b>10%</b>	<b>260</b>	<b>100%</b>	<b>23</b>	<b>8.84%</b>

**Table 3:** Distribution of cases showing lactate dehydrogenase level (LDH) on admission

LDH (IU/L)	Preeclampsia				Eclampsia			
	No.	%	Death	Percentage mortality	No.	%	Death	Percentage mortality
< 600	27	22.50	1	3.70	56	21.54	2	3.57
> 600	93	77.50	11	11.82	204	78.46	21	10.29
<b>Total</b>	<b>120</b>	<b>100%</b>	<b>12</b>	<b>10</b>	<b>260</b>	<b>100%</b>	<b>23</b>	<b>8.84</b>

**Table 4:** Statistical study

LDH	Case	Mean	SD	P value
	Preeclampsia		725.81	195.92
Eclampsia		758.77	234.80	0.154

**Table 5:** Distribution of cases showing serum creatinine on admission

Serum Creatinine (mg/dl)	Preeclampsia		Eclampsia	
	No.	%	No.	%
<1.5	97	80.83	201	77.31
>1.5	23	19.17	59	22.69
<b>Total</b>	<b>120</b>	<b>100%</b>	<b>260</b>	<b>100%</b>

**Table 6:** Distribution of cases on the basis of total serum Bilirubin (mg/dl) on admission

Total Bilirubin (mg/dl)	Preeclampsia		Eclampsia	
	No.	%	No.	%
< 1.2	93	77.50	196	75.38
> 1.2	27	22.50	64	24.62
<b>Total</b>	<b>120</b>	<b>100%</b>	<b>260</b>	<b>100%</b>

rate of approximately 1400 IU/l per day, 600 IU/l per day, 300 IU/l per day and 200 IU/l per day for patients with classes 1, 2 and 3 and for non-HELLP severe Preeclampsia, respectively.<sup>12</sup>

In this study 80.83% of preeclampsia and 77.31% of eclampsia patient had their serum creatinine level within the normal range that is 0.6-1.2 mg/dl.

Martin Jn evaluated clinical and research facility profile in serious toxemia with or without HELLP condition. He found that lactate dehydrogenase level >1400 IU/L, aspartate aminotransferase level >150 IU/L, alanine

aminotransferase level >100 IU/L, uric corrosive level >7.8 mg/dL, serum creatinine level >1.0 mg/dL, and 4+ urinary protein by dipstick can be utilized to separate the patient at high danger for critical maternal bleakness. Convergences of lactate dehydrogenase, aspartate aminotransferase, and uric corrosive over these cut focuses have the most grounded prescient worth and are hazard added substance with deteriorating thrombocytopenia.<sup>13</sup>

#### 4. Conclusion

Eclampsia is associated with significant maternal and perinatal morbidity and mortality. The higher mortality is due to high percentage of the patient being unbooked and majority received no therapeutic intervention until admission. Among the cases studied 76% preeclampsia and 96% eclampsia patient were unbooked case and most of them resided in rural areas while the remaining were from urban slums.

Hyperbilirubinemia was seen in small groups of pre-eclampsia and eclampsia patients. Deranged level of liver enzyme were also found in small group of pre-eclampsia and eclampsia patients. LDH level was found significant higher (more than 600 IU/L) in pre-eclampsia and eclampsia patients.

#### 5. Source of Funding

None.

#### 6. Conflict of Interest

The authors declare no conflict of interest.

#### References

1. ACOG Practice Bulletin: Diagnosis and Management of Preeclampsia and Eclampsia: The American College of Obstetricians and Gynecologists Number 33. Jan 2002. . *Obstet Gynecol.* 2002;99(1):159–67.
2. Gabbe. *Obstetrics: Normal and Problem Pregnancies.* In: Hypertension. Churchill Livingstone; 2007.
3. Mattar F, Sibai BM. Eclampsia. VIII. Risk factors for maternal morbidity. *Am J Obstet Gynecol.* 1990;163:1049–55.
4. Douglas KA, Redman CW. Eclampsia in the United Kingdom. *BMJ.* 1994;309(6966):1395–400.
5. Purkerson ML, Vekerdy L. A history of eclampsia, toxemia and the kidney in pregnancy. *Am J Nephrol.* 1999;19(2):313–9.
6. Nodler J, Moolamalla SR, Ledger EM, Nuwayhid BS, Mulla ZD. Elevated antiphospholipid antibody titers and adverse pregnancy outcomes: analysis of a population-based hospital dataset. *BMC Pregnancy Childbirth.* 2009;9:11. doi:10.1186/1471-2393-9-11.
7. Swain S, Ojha KN, Prakash A, Bhatia BD. Maternal and perinatal mortality due to eclampsia. *Indian Pediatr.* 1993;30(6):771–3.
8. Choudhary P. Eclampsia: a hospital based retrospective study. *Kathmandu Univ Med J (KUMJ).* 2003;1(4):237–41.
9. Wasim T, Siddiqui S, Gulli M. Eclampsia a major cause of maternal and perinatal morbidity and mortality. *Professional.* 2004;11(3):328–33.
10. Demir SC, Evruke C, Ozgunen FT, Urunsak IF, Candan E, Kadayifci O, et al. Factors that influences morbidity and mortality in severe pre-eclampsia, eclampsia and hemolysis, elevated liver enzymes, and low platelet count syndrome. *Saudi Med J.* 2006;27(7):1015–8.
11. Qublan HS, Ammarin V, Bataineh O. Lactic dehydrogenase as a biochemical marker of adverse pregnancy outcome in severe pre-eclampsia. *Med Sci Monit.* 2005;11(8):393–7.
12. Rinehart BK, Terrone DA, May WL, Magann EF, Isler CM, Martin JN. Change in platelet count predicts eventual maternal outcome with syndrome of hemolysis, elevated liver enzymes and low platelet count. *J Matern Fetal Med.* 2001;10(1):28–34.
13. Martin JN, May WL, Magann EF, Terrone DA, Rinehart BK, Blake PG. Early risk assessment of severe preeclampsia: admission battery of symptoms and laboratory tests to predict likelihood of subsequent significant maternal morbidity. *Am J Obstet Gynecol.* 1999;180(6 Pt 1):1407–14.

#### Author biography

**Susmita Mukhopadhyay**, Assistant Professor

**Neeta Natu**, Professor and HOD

**Khushboo Anand**, Junior Resident 2

**Cite this article:** Mukhopadhyay S, Natu N, Anand K. To study the role of serum lactate dehydrogenase in prediction of adverse outcomes of pre-eclampsia and eclampsia. *Indian J Obstet Gynecol Res* 2022;9(1):99-102.