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Significance of LDH in Severity of Hypertensive Disorders of Pregnancy

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Abstract: ***Background: Hypertensive Disorders of Pregnancy (HDP) is the most significant problem in obstetrics. They represent one of the most common problems of pregnancy and lead to increased maternal and perinatal morbidity and mortality. Preeclampsia is a multisystem and multifactorial disease and causes cellular death. Aim: To study the significance of LDH in Hypertensive Disorders of Pregnancy (HDP). Materials and methods: This isa comparative study conducted in the Department of OBG, KIMS Hospital and Research Center. Eighty patients were enrolled for the study, Group A (cases)-40 patients of hypertensive disorders of pregnancy and Group B (controls)-40 normotensive controls, these 40 normotensive controls were properly matched with group A with respect to age and gestational age. All patients in group A and B were subjected to lactate dehydrogenase. The collected data were analyzed with IBM.SPSS statistics software 23.0 Version. Results: In group A, 45% were gestational hypertensive patients, 35% were preeclamptic patients, 12.5% eclampsia, 7.5% chronic hypertension. In the present study LDH was increased in 7.5 % in patients with hypertensive disorder of pregnancy. LDH levels were found to be increased in cases of severe preeclampsia with HELLP syndrome, end organ damage and none of the patients with gestational hypertension and normotensives had raised LDH levels. Conclusion: Our study concludes that LDH helps us know the severity of Hypertensive Disorders of Pregnancy (HDP).***

Keywords: Preeclampsia, Eclampsia, Lactate dehydrogenase

1. Introduction

The World Health Organization (WHO) systematically reviews maternal mortality worldwide and in developed countries, 16 percent of maternal deaths were attributed to hypertensive disorders (Khan, 2006). Preeclampsia has a complex pathophysiology, the primary cause being abnormal placentation. The incidence of hypertensive disorders of pregnancy varies in the range of 1 to 35%[1].Preeclampsia occurs in 3-6% of all pregnancies and the incidence is 1.5 to 2 times higher in primigravida. [2] In India, the incidence of preeclampsia amongst the hospital patients is about 7-10 % of all antenatal admissions[3].

2. Aim and Objectives

To study the significance of LDH in Hypertensive Disorders of Pregnancy (HDP).To compare these parameters with properly matched controls

3. Materials and Methods

Place of study: In the department of Obstetrics and Gynecology in Kempegowda Institute of Medical Sciences, Bangalore

Study duration: 1 year

Sample size: The study comprised of 80 pregnant women. 40 patients with hypertensive disorders of pregnancy (group A) were included for the study and the results were compared with 40 normotensive patients (group B).

Sampling method: Purposive sampling

Inclusion criteria: 40 pregnant women diagnosed with hypertensive disorders of pregnancy admitted under Obstetrics and Gynecology department in Kempegowda Institute of Medical Sciences (group A).Results in group A were compared with 40 normotensive patients and they were selected according to the age of the patient and gestational age of the cases at the time of delivery for proper matching.

Exclusion criteria: In group A and group B patients with medical comorbidities like Diabetes Mellitus, Liver disorder, Renal disease, Cardiovascular disease were excluded from study.

4. Methodology

After taking informed written consent from all the patients demographic features like age, gestation, parity etc were recorder on structured data collection sheet. A detailed medical history of all participants was taken to ensure that they fulfill the inclusion criteria for study. This was followed by thorough physical examination of every case and control. Blood pressure of all participants was measured using manual mercury sphygmomanometer twice for each patient at an interval of 15 to 20 minutes and then after 2 hours of rest, before labeling them as normotensive or with hypertensive disorder of pregnancy.

For all patients in group A and group B basic investigations were done along lactate dehydrogenase. Estimation done using a fully automated biochemical analyser, COBAS c311.

Statistical data analysis

The collected data were analysed with IBM.SPSS statistics software 23.0 Version. To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables. To find the significant difference between the bivariate samples in independent groups the Unpaired sample t-test was used. To find the significance in categorical data Chi-Square test was used similarly if the expected cell frequency is less than 5 in 2×2 tables then the Fisher's Exact was used. In all the above statistical tools the probability value .05 is considered as significant level.

5. Results

Total 80 cases were studied of which,
Group A (cases): 40 patients with hypertensive disorder of pregnancy.
Group B (controls): 40 normotensive pregnant women.

Table 1: Distribution of Group A and Group B according to Age

Age	Group A (Cases)	Group B (Controls)
18 - 20 years	8 (20.0%)	3 (7.5%)
21 - 25 years	16 (40.0%)	21 (52.5%)
26 - 30 years	11 (27.5%)	13 (32.5%)
Above 30 years	5 (12.5%)	3 (7.5%)

In my study group, majority of the patients belong to 21 to 25 years age group (age was matched with group A and group B for proper matching). The youngest being 18 years and the oldest is 37 years.

Table 2: Distribution of Group A and Group B according to Gravidity

Gravida	Cases	Controls
Multi	19 (47.5%)	27 (67.5%)
Primi	21 (52.5%)	13 (32.5%)

In group A (cases), majority were primigravidas constituting 52.5 %.

In group B (controls), majority were multigravidas constituting 67.5 %.

Table 3: Distribution of Group A and Group B according to Gestational Age

Gestational age	Group A (Cases)	Group B (Controls)
< = 33+6 Weeks	10 (25%)	8 (20%)
34 - 36+6 Weeks	13 (32.5%)	10 (25%)
37 - 39+6 Weeks	14 (35%)	18 (45%)
>= 40 Weeks	3 (7.5%)	4 (10%)

Controls were selected according to the gestational age of cases for proper matching.

Majority of the patients were between the gestational age of 37 and 39+6 weeks gestation in both group A and group B.

Table 4: Distribution of Cases according to Various Types of Hypertensive Disorders of Pregnancy

Group A-Cases (n=40)	Frequency	Percentage
GHTN	18	45%
PREECLAMPSIA	14	35%
CHRONIC HYPERTENSION	3	7.5%
ECLAMPSIA	5	12.5%
Total	40	100%

Majority of the cases were diagnosed with gestational hypertension followed by preeclampsia and 5 were cases of eclampsia.
Among 14 preeclampsia cases, 5 were cases of severe preeclampsia.

Table 5: Comparison of LDH Values with Group A and Group B

LDH	Group A (Cases)	Group B (Controls)
< 600 units/L	37 (92.5%)	40 (100.0%)
600 – 800 units/L	2 (5.0%)	0.0%
> 800 units/L	1 (2.5%)	0.0%

In group A (cases), 7.5 % (3 patients) had raised LDH levels. None of the patients in group B had levels >600 units/L. LDH value between 600-800 units/L were 2 cases, among that 1 is a case of eclampsia and the other one is a case of severe preeclampsia with HELLP syndrome and peripartum cardiomyopathy.

LDH value of >800 units/L was 1 case and it is a case of severe preeclampsia with HELLP syndrome and acute renal failure

Table 6: Comparison of Group A and Group B according to Maternal Complications

Maternal complications	Group A (cases)	Group B (controls)
HELLP syndrome	5 (12.5%)	0%
Eclampsia	5 (12.5%)	0%
Abruptio placenta	10 (25%)	0%
Postpartum hemorrhage	14 (35%)	4 (10%)
Acute renal failure	1 (2.5%)	0%
Pulmonary edema	7 (17.5%)	0%
ICU admissions	8 (20%)	0%
Maternal mortality	3 (8%)	0%

Maximum complication seen in group A(cases), is postpartum hemorrhage followed by abruptio placenta constituting 35% and 25% respectively (there were more than 1 complication noted in a single patient).

In group A, 8 cases were admitted in ICU (20%) and 3 cases of maternal mortality.

In group B, the only complication noted was postpartum hemorrhage (4 cases).

6. Discussion

Preeclampsia and eclampsia is a multisystem disorder and causes cellular death. LDH is an intracellular enzyme and its level is increased in these women due to cellular death. In progressive endothelial dysfunction in maternal vascular system induced by toxins released from hypoxic placenta cause profound vasospasm. Serum LDH is the earliest marker seen in blood during oxidative stress and hypoxia. So, serum LDH levels can be used to assess the extent of cellular death and thereby the severity of disease in this group of women[4]. It is raised in cases of preeclampsia and eclampsia. The test is easily available. Detection of high-risk patients with increased levels of LDH mandates close monitoring, prompt and correct management to decrease both maternal and fetal morbidity and mortality.

In group A and group B maximum percentage of patients were in the age group of 21 to 25 years, with the mean age of 25. According to N.R. Hazari et al mean age among cases was 23 and among controls were 25[5].

In group A, primigravidas were more compared to multigravidas, constituting 52.5 % and 47.5 % respectively, which is consistent with various other studies. Primigravida is a proven risk factor for hypertensive disorders of pregnancy. According to Manjusha Sajith et al, 2014 highest incidence of hypertension was occurred in primigravida patients (53.8%)[6]. Hansen reported a two to three fold increase in the incidence in primigravida and this was supported by Chesley[7]. Sibai and his association recently reconfirmed the high risk of developing of pregnancy induced hypertension in primigravidas.

Most common hypertensive disorder of pregnancy found in this study was gestational hypertension followed by preeclampsia, which is consistent with FOGSI which states approximately two third of hypertensive disorders of pregnancy are due to gestational hypertension and preeclampsia and one third are due to chronic hypertension.

In the present study LDH was increased in 7.5 % in patients with hypertensive disorder of pregnancy. LDH levels were found to be increased in cases of severe preeclampsia with HELLP syndrome, end organ damage and none of the patients with non-severe preeclampsia, gestational hypertension and normotensives had raised LDH levels. Thus LDH reflects the severity and occurrence of complications of preeclampsia.

Table 7: Comparison of LDH Levels with Other Studies

Authors	LDH levels	Mean (mg/dl)	Standard deviation
Sonarga AD et al	Cases	356.46	158.09
	Controls	151.57	47.47
Meghal et al,2018[8]	Cases	512.86	137.08
	Controls	226.8	70.26
Present study	Group A (cases)	410.18	677.25
	Group B (controls)	243.5	25.43

In the present study, as in regard with maternal outcome, the most common complication encountered in group A(cases) was postpartum hemorrhage followed by abruptio placenta constituting 35% and 25% respectively. 3 cases of maternal mortality (7.5%) and the main causes of maternal deaths were acute renal failure, disseminated intravascular coagulation and peripartum cardiomyopathy. LDH was significant elevated in all cases of maternal mortality. In group B the only complication noted is postpartum hemorrhage accounting for 10%.

Limitations of our study- Sample size was small [as patients in Group A (cases) were selected only with hypertensive disorders of pregnancy and patients with other comorbidities like diabetes, liver disorder, renal disease and cardiovascular disorders were excluded], we did not correlate the levels of parameter in different classification of hypertensive disorders of pregnancy and its complications.

7. Conclusion

Hypertensive Disorders of Pregnancy are common in India. The basic management objectives included obstetric management, adequate fetal surveillance, antihypertensive management, anticonvulsant therapy, safe analgesia, anaesthetic management of labor and anaesthesia for delivery. ISSHP recommends that women with established strong clinical risk factors for preeclampsia be treated, ideally before 16 weeks but definitely before 20 weeks with low dose aspirin (75-162 mg/d as studied in randomized controlled trials).

The present study insists on the importance of serum level of lactate dehydrogenase on the management of Hypertensive Disorders of Pregnancy and to significantly reduce the morbidity and mortality of the mother and fetus. Lactate dehydrogenase levels correlate with severity of the disease. Progressive increase in their levels should be considered as a signal for prompt intervention to improve pregnancy outcome.

Hypertensive disorders remain among the most significant and intriguing unsolved problems in obstetrics. In further studies, it is critical to find early diagnostic markers which are also cost effective, markers which help us to know the prognosis, effective interventions and preventions of hypertensive disorders of pregnancy which are particularly important to reduce maternal and perinatal complications and ensure both pregnant women and neonates to be healthy and safe.

References

[1] Chesley LC. Hypertensive Disorders in Pregnancy. New York: Appleton-Century- Crofts; 1978.
[2] Ananth CV, Keyes KM, Wapner RJ. Pre-eclampsia rates in the United States, 1980-2010: age-period-cohort analysis. BMJ. 2013 Nov 7. 347:f6564. [Medline].
[3] Alokendu Chatterjee, Geeta Basu. Management of severe hypertension in pregnancy. The journal of Obstetrics and Gynecology of India 2000; 50(5):111-15.
[4] Talwar P et al. Int J Reprod Contracept Obstet Gynecol. 2017 Jun;6(6):2444-2446.
[5] Hazari NR, Haltolkar VS, Munde SM. Study of hepatic enzymes in preeclampsia. International journal of current medical and applied sciences.2014(1)
[6] Manjusha Sajith. Incidence of pregnancy induced hypertension and prescription pattern of antihypertensive drugs in pregnancy. ISSN 2014;6(4):164-6
[7] Aias F, Mancilla-Jimmenez R. hepatic fibrinogen deposits in pre-eclampsia. N Engl J Med. 1976;295:578.
[8] Mehta M, Deokar P, Nagdeote A. A comparative study of serum uric acid, serum lactate dehydrogenase and serum calcium in hypertensive disorders of pregnancy and normal pregnancy. Int J ClinBiochem Res 2019;6(1):90-94.