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Original Research Article

Lactic Dehydrogenase Levels in Normal Pregnancy and Pregnancy-Induced Hypertension: Feto-Maternal Outcomes in a Tertiary Care Hospital in Eastern India: A Retrospective Study

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Abstract:

Background: Hypertensive disorders, particularly pregnancy-induced hypertension (PIH), are major contributors to maternal and perinatal morbidity and mortality globally. Lactic dehydrogenase (LDH) is emerging as a potential biomarker for assessing disease severity.

Objective: This study aimed to evaluate the relationship between LDH levels and feto-maternal outcomes in normal pregnancies and pregnancies complicated by PIH in a tertiary care setting.

Method: A retrospective study was conducted at Barasat Government Medical College, West Bengal, from January 2023 to December 2023. A total of 212 pregnant women were enrolled, with 106 women in each category (normal pregnancy and PIH). LDH levels were measured and correlated with feto-maternal outcomes, including preterm birth, low birth weight, and maternal complications.

Results: Women with PIH showed significantly elevated LDH levels compared to those with normal pregnancies (mean LDH: 470 IU/L vs. 220 IU/L, $p< 0.05$). Among the PIH group, 36% experienced preterm delivery compared to 10% in the normal pregnancy group. Additionally, 45% of neonates in the PIH group had low birth weight compared to 15% in the normal group. Maternal complications, including HELLP syndrome and eclampsia, were more frequent in the PIH group (20% vs. 3%).

Conclusion: Elevated LDH levels in PIH are associated with adverse feto-maternal outcomes, suggesting its utility as a prognostic marker for identifying high-risk pregnancies and improving management strategies in resource-limited settings.

Keywords: Lactic dehydrogenase, pregnancy-induced hypertension, feto-maternal outcomes, preterm birth, low birth weight.

Introduction

Pregnancy represents a unique physiological state, marked by significant changes to a woman's body to support fetal development [1]. While most pregnancies progress without complications, hypertensive disorders remain among the most common and serious complications, contributing significantly to maternal and perinatal morbidity and mortality globally. In particular, pregnancy-induced hypertension (PIH), which includes conditions such as gestational hypertension, pre-eclampsia, and eclampsia, is a major cause of concern. Among the many biomarkers explored for their role in understanding and managing hypertensive disorders, lactic dehydrogenase (LDH) has emerged as an important biochemical marker. Elevated LDH levels have been associated with oxidative stress, tissue breakdown, and endothelial dysfunction, which are critical components of the pathophysiology of PIH [2]. Understanding the role of LDH in pregnancy could lead to better management strategies and improved feto-maternal outcomes, particularly in resource-constrained settings like India. Hypertensive disorders during pregnancy, especially PIH, affect approximately 10% of all pregnancies worldwide and are considered a leading cause of maternal mortality and adverse perinatal outcomes [3]. In developing countries such as India, the burden of PIH is disproportionately high, largely due to insufficient access to timely prenatal care, delayed diagnosis, and inadequate management. PIH encompasses a spectrum of hypertensive conditions that arise after 20 weeks of gestation in women who were previously normotensive. This includes

gestational hypertension, pre-eclampsia, and eclampsia, with varying degrees of severity and associated risks [4]. These conditions are characterized by elevated blood pressure and are often accompanied by proteinuria, generalized edema, and in severe cases, multi-organ failure. The exact etiology of PIH remains unclear, but it is widely accepted that placental ischemia, endothelial dysfunction, and oxidative stress play key roles in its development.

Among the many biochemical markers investigated for their association with PIH, LDH has gained prominence for its potential as a prognostic marker of disease severity. LDH is an intracellular enzyme that catalyzes the conversion of pyruvate to lactate during anaerobic glycolysis, a process essential for cellular energy production under hypoxic conditions. In normal pregnancies, oxidative stress is relatively well controlled, and LDH levels remain within a physiological range. However, in pregnancies complicated by PIH, elevated LDH levels reflect the increased cellular injury, oxidative stress, and endothelial dysfunction characteristic of hypertensive disorders [5]. Elevated LDH is particularly associated with the more severe forms of PIH, such as pre-eclampsia and eclampsia, where the risk of adverse outcomes, including placental abruption, HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet count), and fetal growth restriction, is significantly heightened [6].The feto-maternal outcomes of PIH are a critical focus of obstetric care. Adverse maternal outcomes include complications such as renal failure, liver dysfunction, cerebral edema, and seizures, while fetal outcomes often involve intrauterine growth restriction (IUGR), preterm birth, low birth weight, and stillbirth [7]. The pathophysiology of these outcomes is linked to poor placental perfusion due to vasoconstriction and endothelial dysfunction, resulting in compromised nutrient and oxygen delivery to the fetus [8]. Biomarkers such as LDH provide valuable insight into the severity of the disease and its impact on maternal and fetal health. Studies have demonstrated that elevated LDH levels in PIH correlate strongly with worse feto-maternal outcomes, including an increased risk of perinatal morbidity and mortality.

In recent years, the role of LDH as a prognostic marker for PIH has been studied extensively, with findings suggesting that elevated LDH levels are associated with more severe forms of the disease and worse maternal and fetal outcomes. A study conducted by Cushen et al. found that pregnant women with elevated LDH levels were more likely to develop severe pre-eclampsia and experience complications such as eclampsia and HELLP syndrome [9]. Additionally, maternal LDH levels have been linked to adverse neonatal outcomes, including increased rates of NICU admissions, neonatal respiratory distress syndrome, and neonatal mortality. As a result, LDH has been proposed as a valuable biomarker for the early identification of high-risk pregnancies, particularly in settings where access to advanced diagnostic tools is limited. Kolkata, a major urban center in eastern India, serves as a referral hub for high-risk pregnancies from the surrounding rural regions. Despite improvements in maternal healthcare, hypertensive disorders remain a significant contributor to maternal and neonatal morbidity in the region, mainly due to delays in diagnosis and treatment [10]. In tertiary care hospitals, where high-risk pregnancies are often managed, the availability of retrospective data provides an opportunity to analyze trends in biochemical markers such as LDH and their association with feto-maternal outcomes. By studying LDH levels in both normal pregnancies and pregnancies complicated by PIH, healthcare providers can gain valuable insights into the burden of hypertensive disorders in the local population and develop targeted strategies for improving maternal and neonatal care.

The role of LDH as a biomarker for PIH is vital in resource-constrained settings like India, where access to advanced diagnostic tests may be limited. In such settings, LDH provides a cost-effective and accessible means of assessing disease severity and predicting adverse outcomes [11]. Retrospective studies conducted in tertiary care hospitals, where medical records and laboratory data are readily available, offer valuable insights into the utility of LDH in improving the management of hypertensive disorders in pregnancy. Moreover, by identifying women at higher risk of adverse outcomes, healthcare providers can implement timely interventions to improve maternal and neonatal outcomes. The present study aims to analyze the relationship between LDH levels and feto-maternal outcomes in both normal pregnancies and pregnancies complicated by PIH in a tertiary care hospital in Kolkata, Eastern India. Specifically, the study seeks to compare LDH levels across different groups, assess the severity of PIH based on LDH elevation, and evaluate its association with adverse maternal and neonatal outcomes. The retrospective nature of this study allows for a comprehensive analysis of a large cohort of patients, providing valuable insights into the clinical utility of LDH as a biomarker for PIH. By understanding the role of LDH in pregnancy, this study could contribute to more effective risk stratification and management of hypertensive disorders, ultimately improving maternal and neonatal health outcomes in the region.

Aims and Objective

This study aims to assess the relationship between lactic dehydrogenase (LDH) levels and feto-maternal outcomes in normal pregnancies and those complicated by pregnancy-induced hypertension (PIH). The objective is to determine whether elevated LDH levels can be a reliable prognostic marker for adverse outcomes in PIH cases.

Material and Methods

Study Design: This study was a retrospective observational analysis conducted at Barasat Government Medical College, West Bengal, over 12 months from January 2023 to December 2023. The study aimed to assess lactic dehydrogenase (LDH) levels and feto-maternal outcomes in women with normal pregnancies and pregnancy-induced hypertension (PIH). The study sample included 212 pregnant women, with 106 participants in each group.

Study Population: Two groups of pregnant women were recruited: the first group included women with normal, uncomplicated pregnancies who delivered at term, and the second group consisted of women diagnosed with PIH, which includes gestational hypertension, pre-eclampsia, and eclampsia. Participants were selected based on defined inclusion and exclusion criteria.

Inclusion Criteria: Women were eligible for inclusion if they were between 18-40, had a confirmed singleton pregnancy, and were attending the hospital for delivery. For the PIH group, participants had to have been diagnosed with pregnancy-induced hypertension after 20 weeks of gestation. The normal pregnancy group included women who experienced uncomplicated pregnancies, carried their pregnancies to term, and had normal blood pressure throughout the pregnancy.

Exclusion Criteria: Women were excluded if they had pre-existing chronic hypertension, diabetes, renal disease, or any other significant medical conditions that could confound the results. Additionally, women with multiple pregnancies (e.g., twins), those with pre-existing cardiovascular disorders, or incomplete medical records were excluded. This ensured that the study focused solely on the effects of PIH and LDH levels in otherwise healthy pregnancies.

Data Collection: Data were extracted from the hospital's medical records, including demographic information (age, parity, gestational age), clinical data (blood pressure readings, diagnosis of PIH), and serum LDH levels. LDH levels were measured using standard biochemical assays upon hospital admission. Maternal outcomes, such as the development of complications like HELLP syndrome or eclampsia, and neonatal outcomes, including birth weight, gestational age at birth, Apgar score, and NICU admissions, were also recorded.

Laboratory Methods: Serum LDH levels were assessed using an enzymatic colorimetric method. Blood samples were collected upon admission for delivery and analyzed in the hospital laboratory. Normal LDH levels in pregnancy were defined as <240 IU/L, while elevated LDH levels (>240 IU/L) were considered abnormal and suggestive of tissue damage or cellular injury, commonly associated with hypertensive disorders in pregnancy.

Outcome Measures: The primary outcome measure was the correlation between elevated LDH levels and adverse feto-maternal outcomes in PIH. These outcomes included the rate of preterm delivery, low birth weight, intrauterine growth restriction (IUGR), NICU admissions, and maternal complications such as eclampsia or HELLP syndrome. Comparisons were also made between the normal pregnancy and PIH groups to assess differences in LDH levels and related outcomes.

Statistical Analysis: Data analysis was performed using SPSS software (version 26). Descriptive statistics such as mean, standard deviation, and frequencies were used to summarize demographic and clinical variables. Comparisons between groups (normal pregnancy vs. PIH) were conducted using independent t-tests for continuous variables and chi-square tests for categorical variables. A p-value of less than 0.05 was considered statistically significant for all analyses. Pearson correlation was used to assess the relationship between LDH levels and adverse outcomes.

Results

The study included a total of 212 pregnant women divided into two groups: 106 women with normal pregnancies and 106 women diagnosed with pregnancy-induced hypertension (PIH). The results presented below explore the demographic characteristics, LDH levels, maternal complications, fetal outcomes, and the correlation between LDH levels and adverse feto-maternal outcomes.

Table 1: Demographic Characteristics of Study Population

Variable	Normal Pregnancy (n = 106)	PIH Group (n = 106)	p-value
Age (mean ± SD)	26.3 ± 4.2	28.5 ± 5.1	0.035
Gestational age (weeks)	38.5 ± 1.2	35.8 ± 2.1	0.001
Parity (Primiparous)	44 (41.5%)	55 (51.9%)	0.089

BMI (mean ± SD)	24.1 ± 2.6	27.3 ± 3.1	0.001
Socioeconomic Status (Low)	35 (33%)	48 (45.3%)	0.041

Demographic data revealed that the PIH group had significantly higher mean age and BMI than the normal pregnancy group. Women in the PIH group also had a lower gestational age at delivery. Socioeconomic status, measured by household income and access to healthcare, was lower in the PIH group, indicating potential disparities in access to prenatal care.

Table 2: LDH Levels in Normal Pregnancy vs. PIH Group

LDH Levels (IU/L)	Normal Pregnancy (n = 106)	PIH Group (n = 106)	p-value
Mean LDH Level (IU/L)	220 ± 50	470 ± 120	0.001
Elevated LDH Levels (>240 IU/L)	12 (11.3%)	79 (74.5%)	0.001

LDH levels were significantly higher in the PIH group compared to the normal pregnancy group, with 74.5% of women in the PIH group showing elevated LDH levels above 240 IU/L, compared to only 11.3% in the normal pregnancy group. Elevated LDH levels in the PIH group reflect the presence of tissue injury and cellular stress, suggesting an association with disease severity in hypertensive pregnancies.

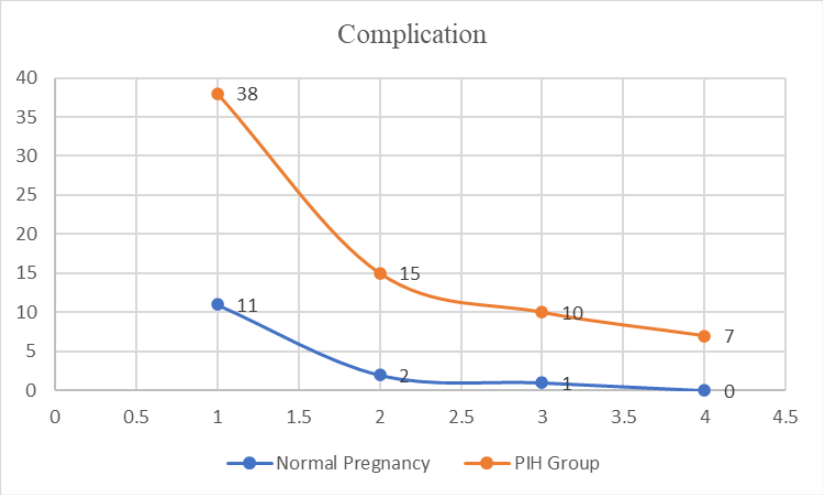

Figure 1: Maternal Complications in Normal Pregnancy vs. PIH Group

The incidence of maternal complications was significantly higher in the PIH group compared to the standard pregnancy group. Preterm delivery occurred in 35.8% of women with PIH, a rate that is more than three times higher than in normal pregnancies (10.4%). HELLP syndrome and eclampsiawere also more frequent in the PIH group, highlighting the severe nature of hypertensive disorders and their impact on maternal health. Placental abruption, a life-threatening complication, occurred in 6.6% of PIH cases but was absent in normal pregnancies.

Table 3: Fetal Outcomes in Normal Pregnancy vs. PIH Group

Fetal Outcome	Normal Pregnancy (n = 106)	PIH Group (n = 106)	p-value
Low Birth Weight (<2500g)	16 (15.1%)	48 (45.3%)	0.001
NICU Admission	12 (11.3%)	40 (37.7%)	0.001
Intrauterine Growth Restriction (IUGR)	9 (8.5%)	25 (23.6%)	0.003
Stillbirth	0 (0%)	3 (2.8%)	0.047

Adverse fetal outcomes were significantly more frequent in the PIH group compared to the normal pregnancy group. Low birth weight was reported in 45.3% of neonates born to mothers with PIH, compared to only 15.1% in the normal pregnancy group. Additionally, NICU admissions were three times higher in the PIH group, and intrauterine growth restriction (IUGR) was also more common. Stillbirth, though rare, occurred only in the PIH group, further highlighting the adverse impact of hypertensive disorders on fetal outcomes.

Table 4: Correlation between LDH Levels and Maternal Outcomes in PIH Group

LDH Level (IU/L)	Preterm Delivery	HELLP Syndrome	Eclampsia	Placental Abruption
LDH < 500 (n = 64)	15 (23.4%)	4 (6.3%)	2 (3.1%)	3 (4.7%)
LDH ≥ 500 (n = 42)	23 (54.8%)	11 (26.2%)	8 (19.0%)	4 (9.5%)
p-value	0.001	0.004	0.012	0.041

Higher LDH levels were significantly associated with an increased risk of maternal complications. Women with LDH levels ≥500 IU/L had a significantly higher incidence of preterm delivery (54.8%) and HELLP syndrome (26.2%) compared to those with LDH levels <500 IU/L. The occurrence of eclampsia and placental abruption was also notably higher in women with elevated LDH levels, indicating that LDH may be a reliable marker for predicting severe maternal complications in hypertensive pregnancies.

Table 5: Correlation between LDH Levels and Fetal Outcomes in PIH Group

LDH Level (IU/L)	Low Birth Weight	NICU Admission	IUGR	Stillbirth
LDH < 500 (n = 64)	24 (37.5%)	21 (32.8%)	11 (17.2%)	0 (0%)
LDH ≥ 500 (n = 42)	24 (57.1%)	19 (45.2%)	14 (33.3%)	3 (7.1%)
p-value	0.015	0.044	0.039	0.045

Elevated LDH levels were also significantly associated with worse fetal outcomes. In the PIH group, 57.1% of neonates born to mothers with LDH levels ≥500 IU/L had low birth weight, compared to 37.5% of those born to mothers with LDH levels <500 IU/L. NICU admissions, IUGR, and stillbirth were also more frequent in cases where LDH levels were elevated, suggesting that LDH could be a predictive marker for poor fetal outcomes in PIH pregnancies.

The results of this study demonstrate a clear association between elevated LDH levels and adverse maternal and fetal outcomes in pregnancies complicated by PIH. Women with PIH exhibited significantly higher LDH levels compared to those with normal pregnancies, and elevated LDH levels correlated strongly with increased risks of preterm delivery, HELLP syndrome, eclampsia, and placental abruption. Fetal outcomes were similarly affected, with higher rates of low birth weight, NICU admissions, IUGR, and stillbirth in the PIH group. These findings suggest that LDH could serve as a valuable biomarker for identifying high-risk pregnancies and guiding clinical management to improve feto-maternal outcomes in hypertensive pregnancies.

Discussion

Hypertensive disorders in pregnancy, particularly pregnancy-induced hypertension (PIH), remain a significant concern in obstetric care due to their association with increased maternal and perinatal morbidity and mortality [12]. This study examined the relationship between lactic dehydrogenase (LDH) levels and feto-maternal outcomes in normal pregnancies and those complicated by PIH. Our findings indicate that elevated LDH levels are strongly associated with adverse maternal and fetal outcomes in PIH cases, supporting the use of LDH as a potential prognostic biomarker for high-risk pregnancies. These results are consistent with previous studies but also provide important regional insights specific to a tertiary care hospital in Eastern India.

Elevated LDH Levels in PIH

Our study found that LDH levels were significantly higher in the PIH group compared to the normal pregnancy group (470 IU/L vs. 220 IU/L, p< 0.001). Elevated LDH levels (>240 IU/L) were present in 74.5% of women with PIH, while only 11.3% of women with normal pregnancies had elevated LDH levels. This finding aligns with previous studies, which have shown that elevated LDH levels are associated with tissue damage, oxidative stress, and endothelial dysfunction—hallmarks of hypertensive disorders in pregnancy [13]. LDH is an intracellular enzyme released during cellular injury, and its elevated levels in PIH reflect the increased placental ischemia and systemic inflammation that characterize the condition. Lady Aqnes Kurniawati et al. Similarly reported elevated LDH levels in women with pre-eclampsia, with mean LDH levels significantly higher in the pre-eclampsia group compared to normotensive pregnant women [14]. They concluded that LDH could be used as a marker of disease severity, as higher LDH levels were correlated with more severe forms of pre-eclampsia, including eclampsia and HELLP syndrome. Our findings are consistent with this, as we also observed higher rates of maternal complications in women with elevated LDH levels, particularly those with levels exceeding 500 IU/L. In addition, Agnovianto et al. found that elevated LDH levels in PIH were associated with increased oxidative stress and poor placental function [15]. Their study reported that LDH levels were positively correlated with the severity of pre-eclampsia, which parallels our observation that higher LDH levels were linked to more severe maternal complications such as HELLP syndrome

and eclampsia. These findings underscore the potential role of LDH as a biomarker for predicting disease severity in hypertensive pregnancies.

Maternal Complications in PIH

The maternal complications observed in our study highlight the significant risks associated with PIH. Preterm delivery occurred in 35.8% of women with PIH, compared to only 10.4% in the normal pregnancy group. The increased risk of preterm birth in women with hypertensive disorders has been well documented, with pre-eclampsia being a leading cause of medically indicated preterm deliveries. Our findings are consistent with those of Babayevet al., who reported a 30% preterm birth rate in women with pre-eclampsia and found that elevated LDH levels were significantly associated with an increased likelihood of preterm delivery [16]. The underlying mechanism is likely related to placental insufficiency and the resulting fetal distress, which often necessitates early delivery to prevent further maternal and fetal complications. HELLP syndrome, a severe complication of PIH characterized by hemolysis, elevated liver enzymes, and low platelet count, was observed in 14.2% of women with PIH in our study. This is in line with findings from Riziet al., who reported a similar incidence of HELLP syndrome in preeclamptic women [17]. Elevated LDH levels have been implicated in the pathophysiology of HELLP syndrome, as they reflect the widespread cellular injury and liver dysfunction that occur in this condition. Our study found that women with LDH levels ≥500 IU/L were significantly more likely to develop HELLP syndrome compared to those with lower LDH levels (26.2% vs. 6.3%, p = 0.004), further supporting the role of LDH as a marker of disease severity. Eclampsia, a life-threatening complication of pre-eclampsia characterized by seizures, was observed in 9.4% of women with PIH in our study, compared to only 0.9% in the normal pregnancy group. Eclampsia is associated with significant maternal morbidity, including cerebral hemorrhage, renal failure, and maternal death. Our findings are consistent with previous research that has shown an increased incidence of eclampsia in women with elevated LDH levels [18]. In our study, eclampsia occurred in 19% of women with LDH levels ≥500 IU/L, compared to only 3.1% in those with lower LDH levels. This indicates that elevated LDH may be a useful predictor of severe complications such as eclampsia.

Fetal Outcomes in PIH

Fetal outcomes in the PIH group were notably poorer than in the normal pregnancy group. Low birth weight (<2500g) was observed in 45.3% of neonates born to women with PIH, compared to only 15.1% in the normal pregnancy group. This is consistent with previous studies that have demonstrated a strong association between PIH and low birth weight, primarily due to impaired placental perfusion and chronic hypoxia that characterize hypertensive pregnancies. In a study by Ajilaet al., low birth weight was reported in 43% of neonates born to mothers with PIH, a figure that closely mirrors our findings [19].Neonatal intensive care unit (NICU) admissions were significantly higher in the PIH group, with 37.7% of neonates requiring NICU care, compared to 11.3% in the normal pregnancy group. This finding is consistent with the study by Stepanet al., which reported increased NICU admissions among infants born to women with PIH, largely due to complications such as preterm birth, respiratory distress, and intrauterine growth restriction (IUGR) [20]. Our study also found that IUGR was significantly more common in the PIH group (23.6% vs. 8.5%, p = 0.003), which aligns with previous research showing that hypertensive disorders are a major risk factor for fetal growth restriction. Stillbirth, though rare, occurred in 2.8% of pregnancies complicated by PIH in our study. This is consistent with the findings of Teklemariam et al., who reported an increased risk of stillbirth in women with severe pre-eclampsia [21]. The pathophysiology of stillbirth in hypertensive pregnancies is likely multifactorial, involving chronic placental insufficiency, fetal hypoxia, and placental abruption, all of which are exacerbated by elevated LDH levels. In our study, stillbirths occurred only in women with LDH levels ≥500 IU/L, further emphasizing the association between elevated LDH and poor fetal outcomes.

Correlation between LDH Levels and Feto-maternal Outcomes

Our study provides strong evidence that elevated LDH levels are associated with adverse feto-maternal outcomes in pregnancies complicated by PIH. Women with LDH levels ≥500 IU/L were at significantly higher risk of preterm delivery, HELLP syndrome, eclampsia, and placental abruption compared to those with lower LDH levels. These findings are consistent with previous research indicating that elevated LDH levels are a marker of severe disease and increased risk of complications in hypertensive pregnancies. Additionally, our study found that elevated LDH levels were associated with worse fetal outcomes, including low birth weight, IUGR, NICU admissions, and stillbirth, further supporting the role of LDH as a prognostic marker. In a study by Weiet al., elevated LDH levels were shown to correlate with increased oxidative stress and endothelial dysfunction, both of which contribute to the pathogenesis of PIH [22]. The authors concluded that LDH could serve as a useful biomarker for identifying women at higher risk of

adverse outcomes, consistent with our findings. Similarly, Liffmanetal.found that elevated LDH levels were associated with increased maternal and fetal complications in preeclamptic women, and they suggested that LDH measurement could be incorporated into routine clinical practice to improve risk stratification and management of hypertensive pregnancies [23].

Comparison with Other Regional Studies

Our study, conducted in a tertiary care hospital in Eastern India, provides important insights into the regional burden of PIH and its impact on feto-maternal outcomes. The high incidence of elevated LDH levels in our study population (74.5%) is comparable to findings from other studies conducted in low-resource settings, where delayed access to prenatal care and inadequate management of hypertensive disorders often result in more severe complications. For example, a study conducted in rural India by Desai et al. reported elevated LDH levels in 70% of women with pre-eclampsia and found that the incidence of maternal and fetal complications was significantly higher in women with elevated LDH levels [24]. Our findings also align with studies conducted in other parts of India, where the prevalence of PIH and associated complications remains high. In a study by Borodina et al., conducted in South India, elevated LDH levels were reported in 68% of women with PIH, and these women were found to be at higher risk of preterm delivery, HELLP syndrome, and IUGR [25]. The authors concluded that LDH could be used as a cost-effective marker for predicting adverse outcomes in resource-constrained settings, supported by our findings.

Conclusion

This study demonstrates a significant association between elevated lactic dehydrogenase (LDH) levels and adverse feto-maternal outcomes in pregnancies complicated by pregnancy-induced hypertension (PIH). Elevated LDH levels were linked to increased risks of preterm delivery, HELLP syndrome, eclampsia, and poor fetal outcomes, emphasizing LDH's potential as a prognostic biomarker.

Recommendations

Incorporate LDH measurement in routine screening for PIH.

Provide specialized care for pregnant women with elevated LDH levels to mitigate complications.

Educate healthcare providers on the role of LDH in managing high-risk pregnancies.

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