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CLINICAL STUDY ON FETAL OUTCOMES OF JAUNDICE DURING PREGNANCY IN AT MADHUBANI MEDICAL COLLEGE.

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ABSTRACT

Background

Jaundice during pregnancy, arising from various etiologies, poses significant risks to mother and fetus health, containing preterm birth, intrauterine growth restriction, and fetal demise. The study aims to investigate the fetal outcomes of pregnant women presenting with jaundice or deranged liver function tests.

Methods

A prospective observational study involving 40 pregnant women with jaundice or abnormal liver function tests was conducted. Demographic, clinical, laboratory, and imaging data were collected, and patients were monitored through the antepartum, intrapartum, and postpartum periods. Outcomes assessed included gestational age at delivery, mode of delivery, and both fetal and maternal outcomes. Statistical analysis was used to identify significant associations.

Results

The mean age was 28.5 years, with a mean gestational age at presentation of 30.2 weeks. Common symptoms were jaundice, vomiting, pruritus, and dark urine. Elevated liver enzymes were noted in all patients. Fetal outcomes included 80% term deliveries, 87.5% live births, 7.5% intrauterine fetal demise, 5% stillbirths, 22.5% NICU admissions, and 5% early neonatal deaths. Maternal outcomes included fulminant liver failure (10%), disseminated intravascular coagulation (5%), eclampsia (5%), 12.5% ICU monitoring, and 2.5% maternal mortality. Significant associations were found between severe jaundice and preterm deliveries, abnormal liver function tests and NICU admissions, and a history of hepatic failure with adverse maternal outcomes.

Conclusion

Jaundice during pregnancy notably impacts both mother and foetus outcomes, leading to increased risks of preterm delivery, neonatal intensive care unit admissions, and severe maternal complications. Early detection, vigilant monitoring, and comprehensive management are crucial to mitigate adverse outcomes.

Recommendations

Healthcare providers should adopt a multidisciplinary approach to managing jaundice in pregnancy, ensuring timely interventions and close monitoring to improve mother and fetus health outcomes. Further research is needed to develop standardized protocols for managing this condition.

Keywords: *Jaundice, Pregnancy, Fetal outcomes, Maternal health, Liver function tests*
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INTRODUCTION

Jaundice during pregnancy is a significant clinical concern that can have serious implications for both the mother and the foetus. It is depicted by elevated bilirubin levels leading to yellow discoloration of the skin, mucous membranes, and sclera. The incidence of jaundice in pregnancy varies widely, with studies suggesting it affects approximately 3-5% of pregnant women [1]. The etiology of jaundice in pregnancy is diverse and can be categorized into hepatic causes, hemolytic causes, and cholestatic disorders, with each category encompassing various conditions such as viral hepatitis, preeclampsia with liver involvement, intrahepatic cholestasis of pregnancy, and hemolytic anemia [2].

Liver diseases rare to pregnancy, like acute fatty liver of pregnancy (AFLP) and HELLP syndrome (Hemolysis, Elevated Liver enzymes, Low Platelet count), are also important considerations. These conditions not only pose a risk to maternal health but are also related with adverse foetus outcomes, involving intrauterine growth restriction (IUGR), preterm birth, and fetal demise. The clinical presentation of jaundice in pregnancy can be varied, ranging from asymptomatic increases in liver enzymes to fulminant liver failure requiring urgent medical intervention [3].

The management of jaundice in pregnancy requires a multi-disciplinary approach involving obstetricians, hepatologists, and neonatologists to optimize outcomes. Early identification and diagnosis are crucial, as prompt treatment can significantly reduce the risk of

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complications. Diagnostic evaluations typically include liver function tests, coagulation profiles, viral hepatitis serologies, and imaging studies such as ultrasound to assess liver morphology and exclude other intra-abdominal pathologies [4].

Understanding the mother and foetus implications of jaundice during pregnancy is critical for improving clinical management and outcomes. Despite advances in prenatal care, the management of jaundice in pregnancy remains challenging due to the potential for rapid progression to severe complications.

Previous studies have demonstrated varying outcomes based on the underlying cause of jaundice. For instance, intrahepatic cholestasis of pregnancy, while generally benign for the mother, is related with an elevated risk of preterm delivery and foetus distress. In contrast, conditions like AFLP and HELLP syndrome carry significant maternal morbidity and mortality risks, necessitating intensive monitoring and often early delivery [5].

This study aims to assess the fetal outcomes of pregnant women presenting with jaundice or deranged liver function tests in a tertiary care center.

METHODOLOGY

Study Design

This is a prospective observational clinical study.

Study Setting

The study was taken out at Department of Obstetrics & Gynecology, Madhubani Medical College, Bihar, India, over a period from June 2023 to May 2024.

Participants

The study involved 40 pregnant women.

Inclusion Criteria

- Pregnant patients in any trimester presenting with jaundice or abnormal liver function tests.

Exclusion Criteria

- Patients with jaundice antecedent to pregnancy,
- with jaundice onset in the postpartum period,
- not consenting to be a part of the study.

Sample size:

To calculate the sample size for this study, the following formula was used for estimating a proportion in a population:

$$n = \frac{Z^2 \times p \times (1-p)}{E^2}$$

Where:

- n = sample size

- Z = Z-score corresponding to the desired level of confidence

- p = estimated proportion in the population

- E = margin of error

Bias

To minimize bias, all eligible participants were included consecutively, and the criteria for inclusion and exclusion were strictly adhered to. Data collection was standardized to ensure consistency.

Variables

The variables included demographic data (age, parity, gestational age), clinical data (symptomatology, medical and obstetric history), examination findings (jaundice, IUGR, hepatomegaly, splenomegaly), laboratory investigations (CBC, liver function, coagulation profile, hepatitis serology), urine tests, imaging studies (ultrasound, CTG, BPP), and outcomes (pregnancy events, delivery mode, fetal and maternal outcomes, complications).

Data Collection and Procedure

1. Initial Assessment: Detailed demographic data, obstetric and medical history were collected.

2. Clinical Examination: A thorough general physical, systemic, and obstetric examination was conducted.

3. Laboratory Investigations: The specified hematological, urine, and imaging tests were performed.

4. Follow-Up: Subjects were monitored through the antepartum, intrapartum, and postpartum periods. Pregnancy and labor outcomes were recorded, including treatment details and fetal outcomes.

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5. Maternal Outcomes: Maternal outcomes during the hospital stay, including any complications and need for ICU monitoring, were documented.

Statistical Analysis

Using the relevant statistical tools, the gathered data were examined after being input into an electronic database. Demographic and clinical features were gathered using descriptive statistics. Whereas variables were shown as means and standard deviations, frequencies and percentages. Chi-square tests and t-tests were used in the comparative study. Statistical significance was attained when the p-value was less than 0.05.

Ethical considerations

The study protocol was approved by the Ethics Committee and written informed consent was received from all the participants.

RESULT

40 pregnant women were included in the study. The participants ranged in age from 20 to 38 years old, with a mean age of 28.5 years (± 4.2). There were 15 primiparous people (37.5%) and 25 multiparous people (62.5%) in the parity distribution. At presentation, the mean gestational age was 30.2 weeks (± 6.5).

Common symptoms at presentation included jaundice (100%), vomiting (85%), pruritus (50%), and dark urine (65%). The mean duration of jaundice before presentation was 7.3 days (SD ± 3.1). General physical examination revealed dehydration in 40% of cases and clinical signs of liver failure in 15% of cases. Hepatomegaly was observed in 35% of patients, while splenomegaly was noted in 10%.

Table 1: Demographic and Clinical Characteristics of Participants

Characteristic	Value
Mean Age (years)	28.5 ± 4.2
Parity	
- Primiparous	15 (37.5%)
- Multiparous	25 (62.5%)
Mean Gestational Age (weeks)	30.2 ± 6.5

Table 2: Symptomatology and Clinical Findings

Symptom/Clinical Finding	Frequency (%)
Jaundice	40 (100%)
Vomiting	34 (85%)
Pruritus	20 (50%)
Dark Urine	26 (65%)
Mean Duration of Jaundice (days)	7.3 ± 3.1
Dehydration	16 (40%)
Signs of Liver Failure	6 (15%)
Hepatomegaly	14 (35%)
Splenomegaly	4 (10%)

Table 3: Laboratory and Imaging Findings

Parameter	Value
Mean AST (U/L)	105 ± 35
Mean ALT (U/L)	110 ± 40
Abnormal Coagulation Profiles	10 (25%)
Hepatitis E	4 (10%)
Hepatitis B	2 (5%)
Hepatomegaly (Ultrasonography)	14 (35%)
Ascites (Ultrasonography)	4 (10%)

Laboratory tests revealed elevated liver enzymes in all patients, with a mean AST level of 105 U/L (SD ± 35) and ALT level of 110 U/L (SD ± 40). Coagulation profiles were abnormal in 25% of patients. Serology for hepatitis showed that 10% of patients had hepatitis E, and 5% had hepatitis B. Ultrasonography confirmed hepatomegaly in 35% and revealed ascites in 10% of cases.

The mean gestational age at delivery was 37.1 weeks (SD ± 2.8). Labor was spontaneous in 60% of cases and

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induced in 40%. The mode of delivery was vaginal in 55% of cases and Caesarean in 45%.

Fetal outcomes showed that 80% were term deliveries and 20% were preterm. There were 35 live births (87.5%), 3 intrauterine fetal demises (IUFD, 7.5%), and 2 stillbirths (5%). Meconium staining was noted in 15% of cases, and 20% required neonatal resuscitation. NICU admissions were necessary for 22.5% of the neonates, and early neonatal deaths occurred in 5%.

Maternal outcomes indicated that 10% of the mothers developed fulminant liver failure, 5% experienced disseminated intravascular coagulation, and 5% had eclampsia. ICU monitoring was required for 12.5% of the women, and the maternal mortality rate was 2.5%.

Table 4: Pregnancy and Labor Outcomes

Outcome	Frequency (%)
Mean Gestational Age at Delivery (weeks)	37.1 ± 2.8
Spontaneous Labor	24 (60%)
Induced Labor	16 (40%)
Vaginal Delivery	22 (55%)
Caesarean Delivery	18 (45%)

Table 5: Fetal and Maternal Outcomes

Outcome	Frequency (%)
Fetal Outcomes	
- Term Deliveries	32 (80%)
- Preterm Deliveries	8 (20%)
- Live Births	35 (87.5%)
- Intrauterine Fetal Demise	3 (7.5%)
- Stillbirths	2 (5%)
- Meconium Staining	6 (15%)
- Neonatal Resuscitation	8 (20%)
- NICU Admissions	9 (22.5%)
- Early Neonatal Deaths	2 (5%)
Maternal Outcomes	
- Fulminant Liver Failure	4 (10%)
- Disseminated Intravascular Coagulation	2 (5%)
- Eclampsia	2 (5%)
- ICU Monitoring Required	5 (12.5%)
- Maternal Mortality	1 (2.5%)

Table 6: Statistical Analysis of Adverse Outcomes

Variable	Outcome	p-value
Severity of Jaundice	Preterm Deliveries	<0.05
Abnormal Liver Function Tests	NICU Admissions	<0.01
History of Hepatic Failure	Adverse Maternal Outcomes	<0.05

Statistical analysis showed significant relation among jaundice in pregnancy and adverse fetal and maternal outcomes. A Chi-square test presented a considerable variation in the frequency of preterm deliveries among women with severe jaundice ($p<0.05$). There was also a statistically substantial association between abnormal liver function tests and the need for NICU admissions ($p<0.01$). Logistic regression analysis revealed that women with a history of hepatic failure had a higher risk of adverse maternal outcomes, including ICU admissions and maternal mortality (OR=2.8, 95% CI: 1.1-7.4).

DISCUSSION

This study examined the fetal and maternal outcomes of 40 pregnant patients who presented with jaundice or deranged liver function tests at a tertiary care center. The mean age was 28.5 years, with the majority being multiparous and presenting at an average gestational age of 30.2 weeks. Common symptoms included jaundice, vomiting, pruritus, and dark urine. Hepatomegaly was observed in 35% of patients, and liver failure signs were noted in 15%.

Laboratory tests revealed elevated liver enzymes in all patients, with a subset showing abnormal coagulation

profiles and hepatitis infections. Imaging studies confirmed hepatomegaly in 35% and ascites in 10% of cases.

The average gestational age at delivery was 37.1 weeks, with 55% of deliveries being vaginal and 45% Caesarean. Fetal outcomes indicated that 80% were term deliveries, with 87.5% live births. However, there were cases of intrauterine fetal demise (7.5%) and stillbirths (5%). Meconium staining was observed in 15%, and 20% of neonates required resuscitation, with 22.5% admitted to NICU. Early neonatal deaths occurred in 5%.

Maternal outcomes showed significant complications, including fulminant liver failure (10%), disseminated intravascular coagulation (5%), and eclampsia (5%). ICU monitoring was necessary for 12.5% of the mothers, and there was a maternal mortality rate of 2.5%.

Statistical analysis showed significant relations among severe jaundice and preterm deliveries, abnormal liver function tests and NICU admissions, and a history of hepatic failure with adverse maternal outcomes, highlighting the critical impact of jaundice on both mother and foetus health. This emphasizes the importance of early detection, close monitoring, and comprehensive management of jaundice in pregnancy to improve outcomes for both mother and child.

Recent studies on jaundice during pregnancy highlight significant impacts on mother and foetus outcomes. In a study at a tertiary care hospital, jaundice was linked to increased maternal mortality and morbidity, with viral hepatitis (particularly hepatitis B) being the most common cause. The study reported a high incidence of preterm delivery (24.3%) and intrauterine fetal death (8.5%) among affected pregnancies [6]. Another study found that intrahepatic cholestasis of pregnancy (ICP) was the leading cause of jaundice, affecting 64.4% of women, with a majority of newborns delivered alive (83.1%) and healthy [7].

In an analysis of 150 antenatal patients, acute viral hepatitis emerged as the most significant cause of jaundice, followed by preeclampsia and ICP, with notable outcomes including a high rate of preterm deliveries (26.7%) and fetal growth restrictions (33%) [8]. A study focusing on HELLP syndrome found it to be the most common cause of jaundice, correlated with severe maternal complications such as disseminated intravascular coagulation (DIC) and high perinatal mortality rates [9].

Research on viral hepatitis in pregnancy indicated that hepatitis E virus (HEV) infection had a particularly high mortality rate (52%), with severe complications including coagulation failure (56%) and acute liver failure (27%) [10]. Another study underscored the critical need for early detection and a multidisciplinary approach to manage jaundice in pregnancy effectively, as it remains a significant cause of mother and foetus morbidity and mortality [11].

Generalizability

The study demonstrated notable associations between severe jaundice and preterm deliveries, abnormal liver function tests and neonatal intensive care unit (NICU) admissions, and a history of hepatic failure with adverse maternal outcomes. With 87.5% live births and 80% term deliveries, the data suggest that early detection, vigilant monitoring, and comprehensive management are crucial in mitigating adverse outcomes. These findings underscore the importance of a multidisciplinary approach in managing jaundice during pregnancy, which can lead to improved maternal and fetal health outcomes on a broader scale.

CONCLUSION

This study highlights the substantial impact of jaundice during pregnancy on both mother and foetus outcomes. Elevated liver enzymes and abnormal liver function were common, leading to increased risks of preterm delivery, neonatal ICU admissions, and severe maternal complications, including liver failure and eclampsia. The findings underscore the importance of early detection, vigilant monitoring, and comprehensive management of jaundice in pregnant patients to mitigate adverse outcomes and improve overall maternal and fetal health.

LIMITATIONS

The limitations of this study include a small sample population who were included in this study. Furthermore, the lack of comparison group also poses a limitation for this study's findings.

RECOMMENDATION

Healthcare providers should adopt a multidisciplinary approach to managing jaundice in pregnancy, ensuring timely interventions and close monitoring to improve mother and fetus health outcomes. Further research is needed to develop standardized protocols for managing this condition.

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LIST OF ABBREVIATIONS

AFLP: Acute Fatty Liver of Pregnancy
ALT: Alanine Aminotransferase
AST: Aspartate Aminotransferase
BPP: Biophysical Profile
CBC: Complete Blood Count
CTG: Cardiotocography
HELLP: Hemolysis, Elevated Liver enzymes, Low Platelet count
ICU: Intensive Care Unit
IUGR: Intrauterine Growth Restriction
IUFD: Intrauterine Fetal Demise
NICU: Neonatal Intensive Care Unit

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CONFLICT OF INTEREST

The authors have no competing interests to declare.

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