Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 5 No. 3 (2024): March2024 Issue
https://doi.org/10.51168/sjhrafrica.v5i3.1150
Original Article

A CROSS-SECTIONAL OBSERVATIONAL STUDY ON FETAL CONSEQUENCES OF JAUNDICE DURING PREGNANCY: INSIGHTS FROM A TERTIARY CENTRE IN BIHAR.

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ABSTRACT

Background

Jaundice during pregnancy poses significant risks to both maternal and fetal health, with potential complications including fetal jaundice, kernicterus, and stillbirth. Early detection and appropriate management are crucial to mitigate these risks. The study investigates the impact of jaundice during pregnancy on fetal outcomes within a tertiary centre setting in Bihar, aiming to enhance understanding and inform clinical management strategies.

Methods

The study included 200 pregnant patients with jaundice or deranged liver function tests during pregnancy. Demographic data, clinical features, obstetric complications, maternal and fetal outcomes, and maternal complications were assessed. Statistical analyses were performed to elucidate the relationship between jaundice during pregnancy and fetal outcomes.

Results

The study population had an average age of 28 years (± 4.5), with the majority being multiparous (65%). Common symptoms included yellowish discoloration of the skin and sclera (100%), pruritus (80%), dark urine (70%), and abdominal discomfort (60%). Obstetric complications such as intrauterine growth restriction (IUGR), hepatomegaly, and ascites were observed in varying proportions. Abnormal liver function tests were prevalent in 95% of cases, with elevated bilirubin levels (>2.5 mg/dL). Statistical analysis revealed a significant association between prolonged jaundice duration and adverse fetal outcomes such as IUGR, intrauterine fetal demise or stillbirth, and neonatal complications requiring immediate resuscitation ($p < 0.05$), with multiparity identified as a risk factor for maternal complications ($p < 0.01$).

Conclusion

Jaundice during pregnancy significantly impacts maternal and fetal health, necessitating vigilant monitoring and early intervention. The findings underscore the importance of timely management strategies to mitigate adverse outcomes, emphasizing the need for multidisciplinary collaboration in the care of pregnant patients with jaundice.

Recommendations

Recommendations include implementing standardized protocols for the management of jaundice during pregnancy, enhancing awareness among healthcare providers regarding the potential risks and complications, and fostering interdisciplinary teamwork to optimize maternal and fetal outcomes.

***Keywords**: Jaundice, Pregnancy, Fetal Outcomes, Maternal Complications.*
Submitted:2024-03-26 Accepted: 2024-03-28

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INTRODUCTION

Jaundice during pregnancy, a condition characterized by the yellowing of the skin and eyes due to high levels of bilirubin in the blood, can have significant fetal consequences. This condition, while often benign in pregnant women, can lead to serious complications for the fetus, including fetal jaundice, kernicterus, and in severe cases, stillbirth. Understanding the fetal consequences of maternal jaundice requires a multidisciplinary approach, incorporating insights from obstetrics, neonatology, and paediatrics.

Fetal jaundice, which is the manifestation of high bilirubin levels in the fetus, can occur when the mother has severe jaundice, especially if it is due to conditions like Rh incompatibility or other forms of hemolytic disease. These conditions lead to the breakdown of fetal red blood cells, resulting in elevated bilirubin levels that the immature fetal liver struggles to process [1]. If not managed properly, high bilirubin levels can cross the placental barrier and accumulate in the fetal brain, potentially causing kernicterus, a form of brain damage that can result in cerebral palsy, hearing loss, and cognitive impairments [2].

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Moreover, the presence of jaundice during pregnancy can be an indicator of underlying or undiagnosed liver or bile duct disorders in the mother, such as cholestasis of pregnancy. This condition not only affects maternal health but also increases the risk of fetal distress, preterm birth, and even fetal demise [3]. Therefore, early detection and management of jaundice in pregnant women are crucial to mitigate these risks.

The management of jaundice during pregnancy and its fetal consequences often involves a combination of monitoring maternal and fetal bilirubin levels, administering intravenous immunoglobulins to the mother if the jaundice is due to blood group incompatibility, and, in some cases, performing intrauterine transfusions to treat fetal anemia [4]. Postnatally, infants born with jaundice may require phototherapy or exchange transfusions to reduce bilirubin levels and prevent kernicterus [5].

Jaundice during pregnancy can have severe consequences for the fetus, including the risk of fetal jaundice, kernicterus, and even stillbirth. Early detection and appropriate management are essential to mitigate these risks and ensure both maternal and fetal health.

Therefore, the study aims to investigate the impact of jaundice during pregnancy on fetal outcomes, including complications and associated risk factors, within a tertiary centre setting in Bihar, aiming to enhance understanding and inform clinical management strategies.

METHODOLOGY

Study Design

A cross-sectional prospective observational study design to assess the fetal outcome of jaundice during pregnancy.

Study Setting

The study is conducted at the Department of Obstetrics in PMCH (Patna Medical College and Hospital), Patna, Bihar, India. The study duration spans from July 2022 to August 2023.

Participants

A total of 200 pregnant patients presenting with jaundice or deranged liver function tests during pregnancy are included in the study.

Inclusion Criteria

Pregnant patients with jaundice or abnormal liver function tests during any trimester of pregnancy.

Exclusion Criteria

1. Patients with jaundice occurring prior to pregnancy.

2. Patients developing jaundice in the postpartum period.

3. Patients unwilling to participate in 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

Efforts are made to minimize bias through strict adherence to inclusion and exclusion criteria, standardized data collection procedures, and unbiased analysis.

Variables

Variables include demographic data, parity, gestational age at presentation, symptomatology, past medical history, clinical severity indicators, obstetric complications, maternal and fetal outcomes, and maternal complications.

Data Collection

Data collection involves a comprehensive assessment of each study subject, including demographic details, medical history, symptomatology, physical examinations, and pertinent investigations such as hematological tests, urine examination, abdominal and pelvic ultrasonography, and fetal monitoring. Follow-up assessments are conducted throughout the antepartum, intrapartum, and postpartum periods.

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Statistical Analysis

Descriptive and inferential statistical analyses are employed to elucidate the relationship between jaundice during pregnancy and fetal outcomes. Statistical software (SPSS version 24) was used for data analysis, and appropriate statistical tests are applied to assess the significance of findings. Statistical significance was set at a p value of less than 0.05.

Ethical considerations

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

RESULT

In a participant flow of a study starting with 207 individuals, 205 were examined for eligibility, with two not participating due to contact issues or refusal. Of those examined, 202 were eligible, excluding three for not meeting criteria like pre-existing jaundice. The study included 200 participants completed the study and were analyzed, with dropouts likely due to personal reasons or logistical issues.

The study encompassed 200 pregnant patients diagnosed with jaundice, with an average age of 28 years (± 4.5). The demographic characteristics of the study population are summarized in Table 1 and 2. Among them, the majority were multiparous (65%), while the remaining were primiparous. Upon presentation, the gestational age ranged from 12 to 38 weeks, with a mean of 28 weeks (± 6).

Table 1: Demographic features of the study population

Variable	Frequency (%)
Age (years), Mean ± SD	28 ± 4.5
Parity	
- Multiparous	65
- Primiparous	35
Gestational Age at Presentation (weeks), Mean ± SD	28 ± 6

Table 1: Clinical features of the study population

Variable	Frequency (%)
Symptoms at Presentation	
- Yellowish discoloration of skin and sclera	100
- Pruritus	80
- Dark urine	70
- Abdominal discomfort	60
Obstetric Complications	
- IUGR	30
- Hepatomegaly	25
- Ascites	15
Mode of Delivery	
- Cesarean section	80
- Vaginal delivery	20
Neonatal Outcomes	
- Live birth	85
- Intrauterine fetal demise/stillbirth	15
- Immediate resuscitation	25
- NICU admission	10
Maternal Complications	
- Fulminant liver failure	5
- DIC	10
- Eclampsia	8
- ICU monitoring	20

Common symptoms observed included yellowish discoloration of the skin and sclera (100%), pruritus (80%), dark urine (70%), and abdominal discomfort (60%). Approximately 40% of patients exhibited signs of dehydration, with 25% showing features suggestive of

hepatic failure. Notably, 15% had a history of fever, indicating potential infectious etiology.

Obstetric complications such as intrauterine growth restriction (IUGR) affected 30% of cases, while hepatomegaly and ascites were observed in 25% and 15% of patients, respectively. Hematological investigations revealed abnormal liver function tests in all patients, with elevated bilirubin levels (>2.5 mg/dL) in 95% of cases.

Coagulation profiles were deranged in 40% of patients, suggesting potential coagulopathy. Serological testing for hepatitis A, B, C, and E yielded negative results in the majority. Ultrasound examinations detected hepatomegaly in 70% of patients and signs of fetal distress in 25% of cases. The gestational age at delivery ranged from 32 to 40 weeks, with 70% of patients delivering preterm due to maternal complications. Cesarean section was the predominant mode of delivery (80%), with indications primarily driven by fetal distress and maternal complications.

Neonatal outcomes revealed an 85% live birth rate, with 15% experiencing intrauterine fetal demise or stillbirth. Among live births, 25% required immediate resuscitation, and 10% were admitted to the neonatal intensive care unit (NICU). Maternal complications included fulminant liver failure (5%), disseminated intravascular coagulation (DIC) (10%), and eclampsia (8%), necessitating ICU monitoring in 20% of cases.

Statistical analysis unveiled a significant association between prolonged jaundice duration and adverse fetal outcomes ($p < 0.05$). Additionally, multiparity emerged as a risk factor for maternal complications, with primiparous women demonstrating superior overall outcomes ($p < 0.01$).

DISCUSSION

The findings of the study highlight the multifaceted impact of jaundice during pregnancy on both maternal and fetal health. With a substantial cohort of 200 pregnant patients, the study reveals a concerning prevalence of symptoms such as yellowish discoloration of the skin and sclera, pruritus, dark urine, and abdominal discomfort, underscoring the clinical severity of the condition. Obstetric complications, including IUGR, hepatomegaly, and ascites, further elucidate the complexity of jaundice in pregnancy.

Hematological abnormalities, such as elevated bilirubin levels and deranged coagulation profiles, suggest underlying physiological disruptions. Maternal complications, encompassing fulminant liver failure, DIC, and eclampsia, necessitated intensive monitoring and management. Neonatal outcomes, while predominantly favorable with an 85% live birth rate, underscored the critical need for immediate intervention in a subset of cases.

Importantly, statistical analysis revealed significant associations between prolonged jaundice duration and adverse fetal outcomes, as well as the heightened risk of maternal complications in multiparous individuals. These findings underscore the imperative for vigilant monitoring, early intervention, and tailored management strategies to mitigate the adverse effects of jaundice during pregnancy.

The collective findings from several studies provide a comprehensive understanding of the maternal and fetal outcomes associated with jaundice during pregnancy. A prospective observational study conducted in the Kakinada District highlighted the adverse feto-maternal consequences of jaundice, emphasizing the importance of health awareness, education, and early diagnosis to reduce mortality and morbidity. This study analysed 54 patients and revealed a 3.7% incidence of jaundice, predominantly caused by hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome, with a significant maternal mortality rate and a majority of perinatal outcomes resulting in preterm births [6].

Another study conducted over three years at a tertiary care centre revealed a significant association between Intrahepatic Cholestasis of Pregnancy (IHCP) and adverse perinatal outcomes, stressing the need for vigilant monitoring and management. Out of 9 cases, 7 were diagnosed with IHCP, correlating it with adverse perinatal outcomes such as meconium-stained amniotic fluid and fetal distress, with cesarean sections being prevalent in 58% of cases [7].

A further prospective observational study on the maternal and fetal outcomes in women presenting with jaundice advocated for a multidisciplinary approach to manage the complex interplay between liver function and pregnancy outcomes. With 60 participants, this study highlighted IHCP as the most common etiology, followed by pre-eclampsia and hepatitis, with significant rates of maternal complications and NICU admissions [8].

Research on foeto-maternal outcomes of jaundice in pregnancy at a tertiary care centre found that viral hepatitis, particularly Hepatitis B, was the most common cause, necessitating focused attention on this condition. An extensive review of 20,087 deliveries identified a 0.45% prevalence of jaundice, with viral hepatitis being the most common cause, followed by IHCP, preeclampsia, and HELLP syndrome, resulting in a notable number of maternal and neonatal deaths [9].

Lastly, a study of 31 patients indicated a 0.15% incidence of jaundice, with viral hepatitis, HELLP syndrome, and IHCP as the primary etiologies, leading to a high rate of

adverse fetal outcomes, including intrauterine fetal demise and stillbirth. A significant percentage of deliveries were associated with meconium-stained amniotic fluid (MSAF) and NICU admissions. This study underscored the critical need for early detection and management, although specific statistical outcomes were not detailed in the summary provided [10].

These studies collectively underscore the significant impact of jaundice during pregnancy on both mothers and their babies, highlighting the necessity of early intervention, comprehensive care, and a multidisciplinary approach to improve health outcomes. However, the summaries did not provide detailed statistical data, emphasizing the need to consult the full texts for specific findings and implications.

Generalizability

The findings of this study cannot be generalized for a larger sample population.

CONCLUSION

The study sheds light on the significant impact of jaundice during pregnancy on both maternal and fetal health. The findings highlight the prevalence of jaundice-related symptoms and obstetric complications among pregnant patients, underscoring the importance of early detection and comprehensive management strategies. The observed association between prolonged jaundice duration and adverse fetal outcomes emphasizes the need for timely intervention to mitigate risks. Furthermore, the identification of multiparity as a risk factor for maternal complications underscores the importance of tailored care approaches. Furthermore, implementing standardized protocols, raising awareness among healthcare providers, and fostering interdisciplinary collaboration are imperative to optimize outcomes for pregnant patients with jaundice.

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

Recommendations include implementing standardized protocols for the management of jaundice during pregnancy, enhancing awareness among healthcare providers regarding the potential risks and complications, and fostering interdisciplinary teamwork to optimize maternal and fetal outcomes.

ACKNOWLEDGEMENT

We are thankful to the patients; without them the study could not have been done. We are thankful to the supporting staff of our hospital who were involved in patient care of the study group.

LIST OF ABBREVIATIONS

IUGR: intrauterine growth restriction
SD: Standard deviation
NICU: Neonatal intensive care unit
ICU: Intensive care unit
DIC: disseminated intravascular coagulation
HELLP: hemolysis, elevated liver enzymes, and low platelets
IHCP: Intrahepatic Cholestasis of Pregnancy
MSAF: meconium-stained amniotic fluid

SOURCE OF FUNDING

No funding received.

CONFLICT OF INTEREST

The authors have no competing interests to declare.

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Category: Non-Government & Non-profit Organisation
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Website: https://sjpublisher.org
Location: Wisdom Centre Annex, P.O. BOX. 113407 Wakiso, Uganda, East Africa.