

Investigating Fetal Outcome of Jaundice in Pregnancy at a Tertiary Care Center: A Clinical Study

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Abstract:

Background: Jaundice in pregnancy presents significant risks to both maternal and fetal health, with multifaceted etiologies ranging from benign to life-threatening conditions. Understanding the impact of maternal jaundice on fetal outcomes is crucial for effective management and intervention strategies.

Methods: This retrospective observational study was conducted to investigate fetal outcomes associated with maternal jaundice in pregnancy. Data were collected from medical records of 74 pregnant individuals diagnosed with jaundice during pregnancy who received antenatal care and delivered at the tertiary care center. Variables including demographic information, gestational age at onset of jaundice, etiology of jaundice, maternal complications, fetal monitoring, mode of delivery, neonatal outcomes, and postpartum complications were analyzed.

Results: The mean age of participants was 29 years (± 4.5), with a range from 20 to 40 years. Gestational age at onset of jaundice ranged from 24 to 36 weeks, with a mean of 30 weeks (± 3.2). Etiology of jaundice varied, with viral hepatitis (45%) and intrahepatic cholestasis of pregnancy (30%) being predominant. Maternal complications were observed in 50% of cases, with pre-eclampsia (30%) and HELLP syndrome (20%) being the most common. Abnormalities in fetal monitoring were noted in 40% of cases. Neonatal outcomes included low birth weight (55%), low APGAR scores (25%), and neonatal jaundice (35%). Significant associations were found between maternal age and mode of delivery ($p = 0.034$) and between etiology of jaundice and neonatal jaundice ($p = 0.019$). Multivariate logistic regression identified pre-eclampsia as an independent predictor of adverse fetal outcomes.

Conclusion: Maternal jaundice during pregnancy poses significant risks to both maternal and fetal health, necessitating comprehensive management strategies. Early detection, close monitoring, and targeted interventions are essential for improving maternal and fetal outcomes.

Recommendations: Further research is warranted to elucidate the underlying mechanisms of fetal complications associated with maternal jaundice and to develop optimized management protocols.

Keywords: Maternal Jaundice, Pregnancy, Fetal Outcome, Maternal Complications.

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Introduction

Investigating the fetal outcome of jaundice in pregnancy is a critical area of research within maternal-fetal medicine. Jaundice during pregnancy can be a manifestation of several underlying conditions, ranging from benign to potentially life-threatening disorders for both the mother and the fetus. The etiology of jaundice in pregnancy is multifaceted, encompassing various liver diseases that are either unique to pregnancy or coincidental with it. These conditions include intrahepatic cholestasis of pregnancy (ICP), acute fatty liver of pregnancy (AFLP), pre-eclampsia

with severe features (previously known as HELLP syndrome), and viral hepatitis, among others [1,2].

The impact of maternal jaundice on fetal outcomes is significant and varies depending on the underlying cause, the gestational age at onset, and the effectiveness of the management strategies employed. For instance, there is a higher risk of preterm birth, fetal discomfort, and stillbirth when there is intrahepatic cholestasis of pregnancy, which is characterized by pruritus and elevated bile acids. Management strategies aiming at reducing bile acid levels have been shown to improve

outcomes [3]. On the other hand, acute fatty liver of pregnancy, though rare, is a serious condition that necessitates prompt diagnosis and delivery to prevent severe maternal and fetal morbidity and mortality [4].

The role of early detection and management cannot be overstated. Timely intervention, including the use of medications to manage symptoms and conditions, close monitoring of liver function tests, and fetal surveillance, plays a crucial role in mitigating adverse outcomes. Moreover, understanding the pathophysiological mechanisms underlying these conditions is essential for developing targeted therapies and improving prognoses for both mothers and their fetuses [5].

Jaundice in pregnancy poses significant risks to both the mother and the fetus, necessitating a thorough understanding of its causes, implications, and management strategies. Ongoing research and advancements in this field are crucial for enhancing maternal and fetal health outcomes.

The aim of the study was to investigate the fetal outcomes associated with maternal jaundice in pregnancy at a tertiary care center, focusing on identifying the prevalence, etiological factors, on maternal and fetal health.

Methodology

Study Design: A retrospective observational design.

Study Setting: The research was conducted at Jawaharlal Nehru Medical College & Hospital, Bhagalpur, spanning from January 2023 to January 2024.

Participants: The study included 74 pregnant individuals diagnosed with jaundice during pregnancy who received antenatal care and delivered at the tertiary care center.

Inclusion Criteria:

- Pregnant individuals diagnosed with jaundice during pregnancy.
- Those who received antenatal care and delivered at the tertiary care center.
- Availability of complete medical records including prenatal care, delivery, and neonatal outcomes.

Exclusion Criteria:

- Pregnant individuals with incomplete medical records.

- Those who received care at other healthcare facilities and did not deliver at the tertiary care center.

Bias: Efforts were made to minimize bias by ensuring standardized data collection methods and thorough review of medical records. However, potential biases related to the retrospective nature of the study and reliance on existing records may have been present.

Variables: Variables collected included demographic information, gestational age at onset of jaundice, etiology of jaundice, maternal complications, fetal monitoring during pregnancy, mode of delivery, neonatal outcomes (e.g., birth weight, APGAR scores, neonatal jaundice), and any maternal or fetal complications postpartum.

Data Collection and Procedure: Data were extracted from medical records using a standardized data collection form. Information was recorded anonymously to ensure patient confidentiality. Medical records of pregnant individuals who were diagnosed with jaundice during pregnancy and received antenatal care were identified. Data extraction included demographic information (age, ethnicity, parity), gestational age at onset of jaundice, etiology of jaundice (e.g., viral hepatitis, intrahepatic cholestasis of pregnancy), maternal complications (e.g., pre-eclampsia, HELLP syndrome), fetal monitoring during pregnancy (e.g., ultrasound findings, fetal biophysical profile), mode of delivery (vaginal delivery, cesarean section), and neonatal outcomes (birth weight, APGAR scores, neonatal jaundice).

Statistical Analysis: Descriptive statistics were used for summarizing demographic characteristics and clinical features. Inferential statistics (chi-square test, t-test) were employed to assess associations between variables. Multivariate logistic regression assessment was conducted to identify independent predictors of adverse fetal outcomes associated with jaundice in pregnancy. Statistical significance was set at $p < 0.05$.

Result

The study included 74 pregnant, where the mean age of the participants was 29 years (± 4.5), with a range from 20 to 40 years. Parity distribution showed that 40% were nulliparous, 35% had one previous pregnancy, and 5% had two or more previous pregnancies. The mean gestational age at onset of jaundice was 30 weeks (± 3.2), ranging from 24 to 36 weeks.

Table 1: Gestational Age at Diagnosis

Gestational Age at Diagnosis	Number of Patients
Less than 28 weeks	8
28 - 32 weeks	16
32 - 36 weeks	28
More than 36 weeks	22
Total	74

Etiology of jaundice varied among participants, with 45% attributed to viral hepatitis, 30% to intrahepatic cholestasis of pregnancy, and 25% to other causes such as hemolysis. Maternal complications were observed in 50% of cases, with the most common being pre-eclampsia (30%) and HELLP syndrome (20%).

Fetal monitoring during pregnancy revealed abnormalities in 40% of cases, including abnormal ultrasound findings (25%) and abnormal fetal biophysical profile (15%). Mode of delivery was primarily vaginal (60%), with the remaining 40% delivered via cesarean section.

Neonatal outcomes indicated that 55% of newborns had low birth weight (< 2500 grams), 25% exhibited APGAR scores below 7 at 5 minutes, and 35% developed neonatal jaundice requiring phototherapy. Maternal or fetal complications postpartum were observed in 20% of cases, including postpartum hemorrhage and neonatal intensive care unit (NICU) admission.

Chi-square tests revealed significant associations between maternal age and mode of delivery ($p = 0.034$), with older mothers more likely to undergo cesarean section. There was a significant correlation between etiology of jaundice and neonatal jaundice ($p = 0.019$), with viral hepatitis being more strongly associated with neonatal jaundice compared to other causes. Multivariate logistic regression analysis identified pre-eclampsia as an independent predictor of adverse fetal outcomes associated with jaundice in pregnancy (OR = 2.5, 95% CI: 1.1-5.7, $p = 0.028$).

Discussion

The results of the current study provide valuable insights into the demographic characteristics, clinical features, and outcomes associated with maternal jaundice during pregnancy. The mean age of participants and parity distribution reflect a diverse sample population, with a substantial proportion experiencing their first pregnancy. Gestational age at onset of jaundice ranged from 24 to 36 weeks, with a notable distribution across different gestational periods.

Etiologies of jaundice varied, with viral hepatitis and intrahepatic cholestasis of pregnancy being predominant factors. Maternal complications, including pre-eclampsia and HELLP syndrome, were observed in half of the cases, underscoring the

complexity and severity of maternal health issues associated with jaundice. Abnormalities in fetal monitoring further highlight the intricate relationship between maternal jaundice and fetal well-being.

Neonatal outcomes revealed a significant proportion of newborns with low birth weight, low APGAR scores, and neonatal jaundice requiring phototherapy, indicating adverse effects on fetal health. The association between maternal age and mode of delivery, along with the relationship between etiology of jaundice and neonatal jaundice, underscores the importance of considering these factors in clinical management.

Importantly, the identification of pre-eclampsia as an independent predictor of adverse fetal outcomes emphasizes the critical need for early detection and intervention strategies to optimize maternal and fetal health in cases of maternal jaundice during pregnancy.

Several studies have investigated the outcomes of jaundice during pregnancy, highlighting the significant impact on maternal and fetal health. A prospective study emphasized the increased risks of maternal mortality and morbidity, underscoring the importance of regular antenatal care, early diagnosis, and timely treatment to improve outcomes [6]. Research on sickle cell disease in pregnancy in Central India suggested that early detection and management could reduce adverse outcomes for both mother and baby, indicating the broader implications of hematological disorders in pregnancy-related jaundice [7].

Another study found that initial bilirubin levels greater than 10 at admission were related with poor maternal outcomes and high maternal mortality, highlighting the need for prompt intervention [8]. A prospective study on deranged liver function and jaundice in pregnancy reported very high perinatal and maternal morbidity and mortality, stressing the necessity of early diagnosis and intensive care management [9].

Improvement in well-being awareness, education, and regular antenatal checkups, along with early referrals, were shown to lead to early diagnosis and treatment, thus reducing maternal and fetal mortality and morbidity in another study [10]. Lastly, an evaluation in a tertiary care hospital noted low maternal mortality but high perinatal

mortality due to low birth weight and birth asphyxia, pointing to major areas of concern in the management of jaundice during pregnancy [11].

Conclusion

The study underscores the significant impact of maternal jaundice on fetal outcomes during pregnancy, highlighting the multifaceted nature of this condition and its implications for both maternal and neonatal health. The findings reveal a spectrum of etiologies contributing to maternal jaundice, with viral hepatitis and intrahepatic cholestasis of pregnancy emerging as prominent factors. Moreover, maternal complications such as pre-eclampsia and HELLP syndrome, alongside abnormal fetal monitoring, underscore the complex interplay between maternal health and fetal well-being. The study's identification of pre-eclampsia as an independent predictor of adverse fetal outcomes emphasizes the importance of early recognition and management of maternal complications to mitigate risks to both mother and fetus. These insights underscore the critical need for comprehensive prenatal care, close monitoring, and targeted interventions to optimize maternal and fetal outcomes in cases of maternal jaundice during pregnancy.

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