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Original Research Article

# A Prospective Study on Pregnancy Complicated with Jaundice with Special Emphasis on Fetomaternal Outcome

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**Abstract**

**Introduction:** Jaundice in pregnancy represents a significant clinical condition associated with considerable fetomaternal morbidity and mortality, particularly in developing countries. It is defined as yellow discoloration of the sclera and skin due to elevated serum bilirubin levels, often reflecting underlying hepatic or hematological dysfunction.

**Aims & Objectives:** The aim of this study is to evaluate the clinical profile of pregnant women with jaundice and assess the fetomaternal outcomes, while the objective is to identify the underlying etiological factors and analyze associated maternal complications and fetal outcomes including morbidity and mortality.

**Materials & Methods:** This was a prospective observational study conducted over a period of 1 year. The study included a total of 100 patients as the sample size.

**Result:** In 100 patients, gestational age was significantly associated with clinical status ($p = 0.001$). Among <28 weeks (13 patients), 8 were present and 5 absent; in 28–36 weeks (47 patients), 17 were present and 30 absent; and in ≥37 weeks (40 patients), 6 were present and 34 absent. Overall, 31 were present and 69 absent, with risk decreasing as gestation advanced.

**Conclusion:** We concluded that pregnancy complicated by jaundice is associated with significant fetomaternal morbidity and mortality, with a varied etiological spectrum in which hepatitis E is the most common cause followed by hepatitis B, intrahepatic cholestasis of pregnancy, HELLP syndrome, acute fatty liver of pregnancy, and other less frequent causes.

**Keywords:** Jaundice in pregnancy, Hepatic disorders in pregnancy, Liver dysfunction, Intrahepatic cholestasis of pregnancy and Perinatal mortality.

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## Introduction

Jaundice in pregnancy represents a significant clinical condition associated with considerable fetomaternal morbidity and mortality, particularly in developing countries. It is defined as yellow discoloration of the sclera and skin due to elevated serum bilirubin levels, often reflecting underlying hepatic or hematological dysfunction. Pregnancy-related jaundice may be caused by a wide spectrum of conditions, ranging from pregnancy-specific disorders such as intrahepatic cholestasis of pregnancy (ICP), preeclampsia with severe features, and HELLP (hemolysis, elevated liver enzymes, and low platelet count) syndrome, to non-obstetric causes like viral hepatitis, gallstone disease, and drug-induced liver injury [1,2]. Among these, viral hepatitis remains a leading cause of jaundice in pregnant women in low- and middle-income countries and is strongly associated with adverse fetal outcomes [3]. The physiological changes of pregnancy, including altered immune response, increased metabolic demands, and hormonal influences on bile acid transport, may predispose women to hepatic dysfunction. These changes can exacerbate pre-existing liver disease or unmask subclinical conditions, leading to clinical jaundice. In particular, hepatitis E virus (HEV) infection has been identified as a major contributor to acute liver failure in pregnancy, with high maternal mortality rates reported in endemic regions [4]. Similarly, hepatitis B virus (HBV)

infection, though often chronic and asymptomatic, can lead to significant perinatal transmission and long-term complications in offspring [5]. Pregnancy-specific liver disorders also play an important role in the etiology of jaundice. Intrahepatic cholestasis of pregnancy typically presents in the third trimester with pruritus and elevated bile acids, and it is associated with increased risks of preterm birth, meconium-stained liquor, and stillbirth [6]. HELLP syndrome, considered a severe variant of preeclampsia, can rapidly progress to multiorgan failure if not promptly diagnosed and managed. These conditions highlight the need for early recognition and timely intervention to improve outcomes.The fetomaternal outcomes in jaundiced pregnancies depend largely on the underlying cause, severity of hepatic involvement, and gestational age at presentation. Maternal complications may include coagulopathy, hepatic encephalopathy, renal failure, and postpartum hemorrhage, while fetal outcomes range from intrauterine growth restriction to preterm delivery and intrauterine fetal demise.

**Materials and Methods**

**Type of Study:** A prospective observational study

**Place of Study:** Murshidabad Medical college Berhampore, Murshidabad

**Study Duration:** 1 year

**Sample Size:** 100 patients

**Inclusion Criteria**

- All pregnant women diagnosed with jaundice during pregnancy (any trimester) admitted or attending the study centre during the study period
- Age group: 18–45 years
- Patients willing to give informed written consent
- Both primigravida and multigravida women included
- Patients with confirmed jaundice based on clinical features and biochemical parameters

**Exclusion Criteria**

- Patients with known chronic liver disease prior to pregnancy (e.g., cirrhosis, chronic hepatitis)
- Pregnant women with pre-existing hemolytic disorders causing jaundice (e.g., sickle cell disease, thalassemia major)
- Drug-induced jaundice due to known hepatotoxic medications unrelated to pregnancy
- Patients unwilling to participate or lost to follow-up
- Incomplete medical records or missing essential laboratory data

**Study Variables**

- Age
- Gravidity and parity
- Gestational age at onset of jaundice
- Etiology of jaundice (viral hepatitis A/E/B, ICP, HELLP, acute fatty liver of pregnancy, etc.)
- Clinical symptoms (jaundice, nausea, vomiting, pruritus, abdominal pain)
- Liver function tests (total bilirubin, direct bilirubin, SGOT, SGPT, ALP)
- Coagulation profile (PT/INR)
- Maternal complications (hepatic failure, PPH, DIC, encephalopathy, ICU admission, mortality)
- Mode of delivery (vaginal/LSCS)
- Length of hospital stay
- Gestational age at delivery
- Preterm delivery

**Statistical Analysis:** Data were entered into Excel and subsequently analyzed using SPSS and GraphPad Prism. Continuous variables were summarized as means with standard deviations, while categorical variables were presented as counts and percentages.

Comparisons between independent groups were performed using two-sample t-tests, and paired t-tests were applied for correlated (paired) data. Categorical data were compared using chi-square tests, with Fisher's exact test applied when expected cell counts were small. A p-value of $\leq 0.05$ was considered statistically significant.

**Result**

**Table 1: Etiology of Jaundice and Maternal Complications**

| Etiology | Present | Absent | Total | p-value |
|---|---|---|---|---|
| Hepatitis E | 18 (51.4%) | 17 (48.6%) | 35 (100%) | 0.007 |
| Hepatitis B | 5 (25.0%) | 15 (75.0%) | 20 (100%) | |
| ICP | 2 (11.1%) | 16 (88.9%) | 18 (100%) | |
| HELLP | 6 (50.0%) | 6 (50.0%) | 12 (100%) | |
| AFLP | 4 (50.0%) | 4 (50.0%) | 8 (100%) | |
| Others | 1 (14.3%) | 6 (85.7%) | 7 (100%) | |
| Total | 36 (36%) | 64 (64%) | 100 (100%) | |

**Table 2: Serum Bilirubin Level and Maternal Outcome**

| Serum Bilirubin (mg/dL) | Present | Absent | Total | p-value |
|---|---|---|---|---|
| <5 | 4 (12.5%) | 28 (87.5%) | 32 (100%) | < 0.001 |
| 5–10 | 12 (31.6%) | 26 (68.4%) | 38 (100%) | |
| >10 | 20 (66.7%) | 10 (33.3%) | 30 (100%) | |
| Total | 36 (36%) | 64 (64%) | 100 (100%) | |

**Table 3: Gestational Age and Adverse Fetal Outcome**

| Gestational Age | Present | Absent | Total | p-value |
|---|---|---|---|---|
| <28 Weeks | 8 (61.5%) | 5 (38.5%) | 13 (100%) | 0.001 |
| 28–36 Weeks | 17 (36.2%) | 30 (63.8%) | 47 (100%) | |
| ≥37 Weeks | 6 (15.0%) | 34 (85.0%) | 40 (100%) | |
| Total | 31 (31%) | 69 (69%) | 100 (100%) | |

**Table 4: Mode of Delivery and NICU Admission**

| Mode of Delivery | NICU | No NICU | Total | p-value |
|---|---|---|---|---|
| Vaginal | 11 (20.8%) | 42 (79.2%) | 53 (100%) | 0.04 |
| LSCS | 18 (41.9%) | 25 (58.1%) | 43 (100%) | |
| Undelivered/IUFD | 2 (50.0%) | 2 (50.0%) | 4 (100%) | |
| Total | 31 (31%) | 69 (69%) | 100 (100%) | |

**Table 5: Etiology and Perinatal Mortality**

| Etiology | Mortality | Survival | Total | p-value |
|---|---|---|---|---|
| Hepatitis E | 8 (22.9%) | 27 (77.1%) | 35 (100%) | 0.029 |
| Hepatitis B | 2 (10.0%) | 18 (90.0%) | 20 (100%) | |
| ICP | 0 (0%) | 18 (100%) | 18 (100%) | |
| HELLP | 3 (25.0%) | 9 (75.0%) | 12 (100%) | |
| AFLP | 2 (25.0%) | 6 (75.0%) | 8 (100%) | |
| Others | 0 (0%) | 7 (100%) | 7 (100%) | |
| Total | 15 (15%) | 85 (85%) | 100 (100%) | |

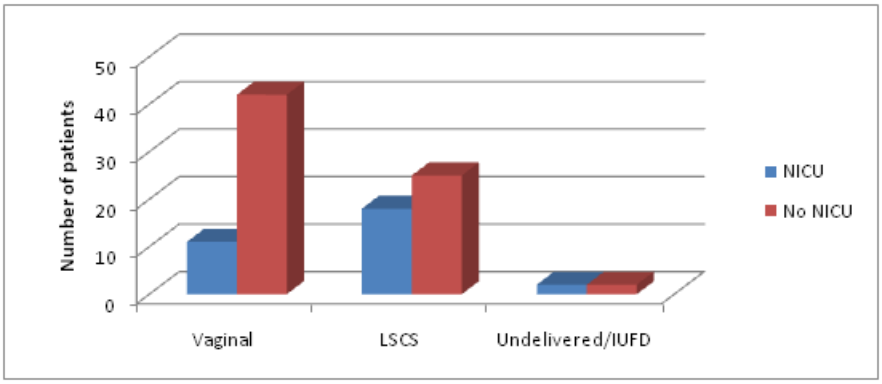


**Figure 1: Mode of Delivery and NICU Admission**

In our study present study of 100 patients, Hepatitis E was the most common ethology with 35 patients (35%), of which 18 were in the present group and 17 in the absent group. Hepatitis B accounted for 20 patients (20%), with 5 in the present group and 15 in the absent group. ICP was observed in 18 patients (18%), with 2 present and 16 absent. HELLP syndrome was seen in 12 patients (12%), equally distributed with 6 in each group. AFLP accounted for 8 patients (8%), with 4 in each group. Other causes were noted in 7 patients (7%), with 1 in the present group and 6 in the absent group. Overall, 36 patients (36%) were in the present group and 64 patients (64%) were in the absent group, and the distribution was statistically significant ($p = 0.007$).In the present study of 100 patients, serum bilirubin levels showed a significant association with clinical status. In the <5 mg/dL group, 32 patients were included, with 4 (12.5%) in the present group and 28 (87.5%) in the absent group. In the 5–10 mg/dL group, out of 38 patients, 12 (31.6%) were present and 26 (68.4%) were absent. In the >10 mg/dL group, among 30 patients, 20 (66.7%) were present and 10 (33.3%) were absent. Overall, 36 patients (36%) were in the present group and 64 patients

(64%) were in the absent group. The association between serum bilirubin levels and clinical status was found to be highly statistically significant ($p < 0.001$).In the present study of 100 patients, gestational age showed a significant association with clinical status. Among patients at <28 weeks of gestation (13 cases), 8 (61.5%) were in the present group and 5 (38.5%) were in the absent group. In the 28–36 weeks group (47 cases), 17 (36.2%) were present and 30 (63.8%) were absent. In ≥37 weeks gestation (40 cases), 6 (15.0%) were present and 34 (85.0%) were absent. Overall, 31 patients (31%) were in the present group and 69 patients (69%) were in the absent group. The association between gestational age and clinical status was statistically significant ($p = 0.001$).In the present study of 100 patients, mode of delivery showed a statistically significant association with neonatal outcome. Among vaginal deliveries (53 cases), 11 neonates (20.8%) required NICU admission and 42 (79.2%) did not require NICU care. In the LSCS group (43 cases), 18 neonates (41.9%) required NICU admission and 25 (58.1%) did not. In the undelivered/IUFD group (4 cases), 2 cases (50.0%) were associated with NICU admission and 2 (50.0%) were without NICU admission. Overall, 31 neonates (31%) required NICU admission and 69 (69%) did not. The association between mode of delivery and NICU admission was statistically significant ($p = 0.04$).In the present study of 100 patients, etiological factors showed a statistically significant association with maternal outcome. Hepatitis E was the most common cause, accounting for 35 cases, with 8 deaths (22.9%) and 27 survivals (77.1%). Hepatitis B was observed in 20 cases, with 2 deaths (10.0%) and 18 survivals (90.0%). ICP (18 cases) and other causes (7 cases) had no mortality, with 100% survival in both groups. HELLP syndrome accounted for 12 cases, with 3 deaths (25.0%) and 9 survivals (75.0%), while AFLP (8 cases) showed 2 deaths (25.0%) and 6 survivals (75.0%). there were 15 deaths (15%) and 85 survivals (85%). The association between etiology and mortality was statistically significant ($p = 0.029$).

## Discussion

The present prospective observational study evaluated 100 pregnant women with jaundice, with special emphasis on fetomaternal outcomes. Pregnancy-associated jaundice remains a significant obstetric and medical complication, particularly in developing countries, where infectious and pregnancy-specific liver disorders contribute substantially to maternal and perinatal morbidity and mortality. In the current study, Hepatitis E virus (HEV) infection was the most common etiological factor, accounting for 35% of cases, followed by Hepatitis B (20%), intrahepatic cholestasis of pregnancy (18%), HELLP syndrome (12%), acute fatty liver of pregnancy (8%), and other causes (7%). The predominance of Hepatitis E in pregnancy-associated jaundice has been consistently reported in endemic regions. Khuroo et al. demonstrated that HEV is the leading cause of acute viral hepatitis in pregnancy and is associated with a severe clinical course and increased maternal mortality [7]. Similarly, Chawla et al. reported that HEV infection in pregnancy is associated with fulminant hepatic failure and adverse fetomaternal outcomes, particularly in the third trimester [8]. The high prevalence of HEV in the present study reflects the endemic nature of fecal–oral transmission in the region. In the present study, serum bilirubin levels showed a statistically significant correlation with disease severity and clinical outcome ($p < 0.001$). Patients with serum bilirubin >10 mg/dL demonstrated a markedly higher proportion of adverse clinical status compared to those with lower levels. This finding indicates that hyperbilirubinemia is a reliable marker of disease severity in pregnancy-associated liver dysfunction. Beniwal et al. also observed that higher bilirubin levels in pregnant women with acute viral hepatitis were significantly associated with increased maternal complications and mortality [9]. Mirghani and Mohammed further reported that deranged liver function parameters, including elevated bilirubin, are strong predictors of poor maternal and fetal outcomes [10]. Gestational age at presentation was also significantly associated with clinical status in the present study ($p = 0.001$), with poorer outcomes observed in early gestational age groups. This may be explained by reduced physiological adaptation and increased susceptibility of both mother and fetus during early pregnancy. Sharma et al. reported similar findings, noting that jaundice occurring in the second trimester is associated with higher fetal loss and maternal complications compared to later gestational ages [11]. These findings emphasize the importance of early recognition and aggressive management in early pregnancy cases. The mode of delivery was significantly associated with neonatal outcome, particularly NICU admission ($p = 0.04$). Higher NICU admission rates observed in the LSCS group likely reflect the severity of maternal illness rather than the operative procedure itself. Shukla et al. reported comparable findings, where adverse neonatal outcomes and increased NICU admissions were more frequent in pregnancies complicated by severe jaundice requiring operative delivery [12]. This highlights that obstetric intervention is often necessitated by maternal and fetal compromise. The present study also demonstrated a statistically significant association between etiological factors and maternal mortality ($p = 0.029$). Hepatitis E, HELLP syndrome, and acute fatty liver of pregnancy were associated with the highest

mortality rates, while ICP and other benign causes showed no mortality. the findings of the present study highlight that pregnancy complicated with jaundice is associated with significant fetomaternal risk. The outcome is largely dependent on the underlying etiology, degree of hyperbilirubinemia, and gestational age at presentation. Early diagnosis, timely referral, and multidisciplinary management are essential to improve maternal and neonatal outcomes.

## Conclusion

We concluded that pregnancy complicated by jaundice is associated with significant fetomaternal morbidity and mortality, with a varied etiological spectrum in which hepatitis E is the most common cause followed by hepatitis B, intrahepatic cholestasis of pregnancy, HELLP syndrome, acute fatty liver of pregnancy, and other less frequent causes. The study demonstrates a statistically significant association between etiology and clinical status, with worse outcomes observed in severe infectious and hepatocellular causes. Serum bilirubin level is an important prognostic marker, as higher bilirubin values are strongly associated with increased severity of disease and poorer clinical condition. Gestational age at presentation also plays a crucial role, with early gestation showing higher maternal risk compared to term pregnancies, indicating the impact of physiological reserve and disease tolerance. Mode of delivery significantly influences neonatal outcome, with higher NICU admissions observed in operative and complicated deliveries compared to vaginal delivery, reflecting underlying maternal and fetal compromise. Maternal mortality was notably higher in hepatitis E and AFLP cases, while ICP and some other etiologies showed comparatively better outcomes. Overall, the study highlights that early diagnosis, careful monitoring of liver function parameters, timely obstetric intervention, and multidisciplinary management are essential to reduce adverse fetomaternal outcomes and improve survival in pregnancies complicated by jaundice.

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