MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.9.310.315

# A Clinical Study of Etiology of Jaundice in Pregnancy

[1]Vandana, [2]G. Anil Kumar

[1]*Department of Obstetrics and Gynaecology, Raichur Institute of Medical Sciences (RIMS), Raichur, India*

[2]*Department of Medical Gastroenterology, Rajiv Gandhi Super specialty Hospital-RGSSH(OPEC) Hospital, Raichur, India*

OPEN ACCESS

**Key Words**
Jaundice, pregnancy, PIH/HELLP syndrome, viral hepatitis, liver disorders, maternal morbidity

**Corresponding Author**
G. Anil Kumar,
Department of Medical Gastroenterology, Rajiv Gandhi Super specialty Hospital-RGSSH (OPEC)Hospital, Raichur, India

**Author Designation**
[1,2]Assistant professor

**Received:** 5 June 2024
**Accepted:** 30 June 2024
**Published:** 12 August 2024

**Citation:** Vandana and G. Anil Kumar, 2024. A Clinical Study of Etiology of Jaundice in Pregnancy. Res. J. Med. Sci., 18: 310-315, doi: 10.36478/makrjms.2024.9.310.315



**ABSTRACT**

Jaundice in pregnancy is a significant medical disorder that complicates 3-5% of pregnancies, contributing to substantial maternal and neonatal morbidity and mortality. It can result from liver disorders specific to pregnancy, non-specific liver disorders, or pre-existing liver conditions that worsen during pregnancy. The incidence of jaundice in pregnancy varies globally, with limited comprehensive studies documenting its etiological factors in certain regions, including India. The study aimed to determine the spectrum of etiological factors responsible for jaundice in pregnancy, examine the clinical and laboratory profiles of affected pregnant patients and analyze the distribution of jaundice concerning age, parity and trimester. This descriptive study was conducted at a tertiary care teaching hospital over 18 months, including 100 pregnant and postpartum patients presenting with jaundice. A comprehensive clinical assessment, detailed history-taking, physical examination and a range of laboratory investigations were performed to establish the diagnosis and monitor liver function. Etiological factors were categorized into pregnancy-specific, non-specific and pre-existing liver disorders. The study found that 92% of patients were aged 30 years or younger, with 84% of jaundice cases occurring in the third trimester. PIH/HELLP syndrome was the most common cause (38%), followed by viral hepatitis (34%). Hepatitis B was the predominant viral etiology. The third trimester and postpartum period were critical for the onset of these conditions. Liver disorders specific to pregnancy accounted for 54% of cases, highlighting the complexity of managing jaundice in pregnancy. The study underscores the need for early screening, multidisciplinary care and further research to improve outcomes in pregnancies complicated by jaundice. The findings highlight the third trimester as a high-risk period, particularly for conditions like PIH/HELLP and viral hepatitis.

## INTRODUCTION

Jaundice in pregnancy is an important medical disorder, complicating otherwise normal pregnancies. Pregnancy with jaundice is considered as a high-risk pregnancy. It complicates 3-5% of pregnancies and is one of the important causes of maternal and neonatal morbidity and mortality worldwide. The incidence of jaundice in pregnancy is 0.4-0.9/1000 in India[1].

Jaundice in pregnancy can occur due to liver disorders, which can be classified into three categories: liver disorders specific to pregnancy, liver disorders non-specific to pregnancy (which can also affect non-pregnant women) and pre-existing liver disorders that can worsen during pregnancy. Jaundice in pregnancy presents a challenge to treating physicians and obstetricians, especially in developing countries like India. Physicians are faced with a wide array of differential diagnoses in managing complications of liver dysfunction. Signs and symptoms are often not specific and consist of icterus, nausea, vomiting, abdominal pain and pruritus. The underlying disorder can have a significant effect on morbidity and mortality in both mother and fetus; hence, the diagnostic workup should be initiated promptly.

The etiological factors and incidence of jaundice in pregnancy vary markedly across countries and regions [2]. There are not many comprehensive studies in this region that document these factors. Thus, there is a need for a study to establish the different causative factors responsible for jaundice in pregnancy. Hence, this study was conducted with the objectives of determining the spectrum of etiological factors responsible for jaundice in pregnancy, studying the clinical and laboratory profile of pregnant patients with jaundice and analyzing the distribution of jaundice concerning age, parity and trimesters.

## MATERIAL AND METHODS

The study was conducted in a tertiary care teaching hospital over a duration of 18 months, from December 2022-May 2024. This descriptive study was designed to evaluate pregnant and postpartum patients presenting with jaundice, who were admitted to Raichur Institute of medical sciences (RIMS), Raichur. A total of 100 patients were selected for the study through simple random sampling, ensuring that the sample represented the population accurately. All pregnant and postpartum patients who presented with jaundice during the study period and were admitted to the hospital were included, without any exclusions. Written and informed consent was obtained from all participants in their vernacular language, ensuring that they fully understood the nature of the study and their involvement.

Upon inclusion, a detailed clinical assessment was performed for each patient. This began with a comprehensive history-taking process where patients were queried about their presenting complaints, such as nausea, vomiting, pruritus, anorexia, yellow-colored urine, pale stools, edema of the legs, bleeding tendencies, joint pain, fever and other related symptoms. These symptoms were explored to establish the duration and severity of their jaundice. A thorough physical examination was conducted at the time of presentation, focusing on identifying key clinical signs such as fever, pallor, jaundice, altered sensorium, convulsions, oliguria, hepatosplenomegaly, bleeding diathesis and other indicators of liver cell failure. Particular attention was given to the patient's previous obstetric history, including any history of blood transfusions and drug use. The patient's age, trimester of pregnancy and antenatal care (ANC) details were also meticulously recorded.

Following the clinical assessment, an extensive range of investigations was carried out to confirm the etiological diagnosis of jaundice and to assess the maternal parameters comprehensively. Hemoglobin levels, complete blood count and platelet counts were recorded for each patient. A complete hemogram was performed, along with a peripheral blood smear examination to detect hemolysis, malarial parasites and abnormal red blood cells. Urine analysis was conducted to detect proteinuria using a dipstick and the urine was also subjected to routine and microscopic examination. Liver function tests (LFTs) were systematically carried out on day 1, 3, 5, 7 and on discharge or death to monitor the progression of liver dysfunction. These tests included measurements of total and indirect serum bilirubin, aspartate transaminase (AST), alanine transaminase (ALT), alkaline phosphatase and protein levels including total proteins, albumin, globulin and the albumin-to-globulin (A) ratio. Renal function tests were also part of the investigative protocol, with blood urea, serum creatinine and uric acid levels being measured. The coagulation profile of each patient was assessed by determining prothrombin time (PT), international normalized ratio (INR) and activated partial thromboplastin time (aPTT). Additionally, serum electrolytes were measured to monitor and manage any imbalances.

To identify viral causes of jaundice, viral markers for hepatitis A, B, C and E were tested, along with the HIV tridot ELISA test. The presence of hepatitis B surface antigen (HbSAg) was checked for hepatitis B virus (HBV) and specific immunoglobulin M (IgM) antibodies were tested for hepatitis A (IgM HAV), hepatitis E (IgM HEV) and hepatitis C (IgM anti-HCV) to confirm viral hepatitis. Imaging studies were performed to complement the clinical and laboratory assessments. Ultrasonography of the abdomen and pelvis was conducted on all patients, providing critical information regarding liver size and echotexture, splenomegaly, the presence of ascites and fetal status.

In cases where further investigation was required, additional specialized tests were carried out. These included upper gastrointestinal (UGI) endoscopy, serum lactate dehydrogenase (LDH) levels, autoimmune markers such as antinuclear antibodies (ANA) and anti-smooth muscle antibodies (ASMA) and specific tests for Wilson's disease, including serum ceruloplasmin levels and 24-hour urinary copper levels. Doppler studies of the hepatic veins, inferior vena cava (IVC) and portal vein size were also performed where indicated. In selected cases, a slit-lamp examination was conducted to detect Kayser-Fleischer rings, which are pathognomonic of Wilson's disease. The data collected from the clinical assessments, laboratory investigations and imaging studies were analyzed using SPSS version 20.0 software. Data was represented in the form of Frequencies and proportions.

## RESULTS AND DISCUSSION

The patients' ages ranged from 19-40 years, with an average age of 25.1 years. A significant majority (92%) of the patients were aged 30 years or younger, while only 8% were older than 30 years. The distribution of cases across different trimesters showed that most cases (84%) occurred in the third trimester, with 8% in the postpartum period, 6% in the second trimester and only 2% in the first trimester. Half of the cases were observed in first-time pregnancies, 26% in second pregnancies and 24% in third or higher-order pregnancies. Symptomatically, all 100 patients (100%) presented with icterus, while vomiting was noted in 60% of the cases, anorexia in 42%, fever and abdominal pain in 40% each, altered sensorium in 26%, oliguria in 18% and pruritus in 14%. Clinically, pallor was observed in 48% of the patients and pedal edema was present in 58% of cases [Table 1].

The etiological analysis revealed that PIH/HELLP syndrome was the most common cause of jaundice, accounting for 38% of cases, followed by viral hepatitis (34%), intrahepatic cholestasis of pregnancy (IHCP) at 10%, sepsis with multiple organ dysfunction syndrome (MODS) at 8%, acute fatty liver of pregnancy (AFLP) at 6%, autoimmune hepatitis (AIH) at 2% and common bile duct (CBD) obstruction at 2% [Table 2].

Among the cases of viral hepatitis (n=34), hepatitis B was the most prevalent, observed in 59% of the cases, followed by hepatitis E (24%), hepatitis B and HSV co-infection (6%) and hepatitis B and hepatitis E co-infection (11%). Focusing on hepatitis B infection specifically, out of 26 cases, 77% were due to hepatitis B alone, 15% involved co-infection with hepatitis E and 8% involved co-infection with HSV.

When analyzing the trimester-wise etiological profile of jaundice, it was found that PIH/HELLP syndrome occurred predominantly in the third trimester (34 cases) and postpartum period (4 cases), while viral hepatitis primarily manifested in the third trimester (32 cases). IHCP was mostly observed in the third trimester (8 cases), with only a few cases in the second trimester (2 cases). Sepsis with MODS occurred in the third trimester (6 cases) and the second trimester (2 cases). AFLP cases were noted in the third trimester (2 cases) and postpartum period (4 cases). AIH and CBD obstruction were less common and were observed in the later stages of pregnancy [Table 3].

The study also examined acute liver failure (ALF) among 22 patients, identifying severe preeclampsia/HELLP syndrome as the leading cause (72.7%), followed by AFLP (18.2%) and hepatitis E (9.1%). Regarding jaundice severity among 100 patients, 76% had bilirubin levels below 6 mg/dl, 18% had levels between 6 and 15 mg/dl and 6% had levels above 15 mg/dl.

Among liver disorders specific to pregnancy, which consisted of 54 cases, PIH/HELLP syndrome was the most prevalent, accounting for 70.4% of cases. Intrahepatic cholestasis of pregnancy (IHCP) was observed in 18.5% of the cases, while acute fatty liver of pregnancy (AFLP) was reported in 11.1% of the cases. In the group of liver disorders nonspecific to pregnancy, comprising 44 cases, viral hepatitis was the predominant condition, occurring in 77.3% of cases. Sepsis with multiple organ dysfunction syndrome (MODS) followed, contributing to 18.2% of the cases and common bile duct (CBD) obstruction was the least common, with only 4.5% of cases. Additionally, there were two cases of pregnancy complicating pre-existing chronic liver disease, both of which were attributed to autoimmune hepatitis, representing 100% of that category [Table 4].

Jaundice in pregnancy is an important medical disorder, complicating otherwise normal pregnancies. Pregnancy with jaundice is considered as a high-risk pregnancy. It complicates 3-5% of pregnancies and is one of the important causes of maternal and neonatal morbidity and mortality worldwide. The incidence of jaundice in pregnancy is 0.4-0.9/1000 in India[1].

Jaundice in pregnancy can occur due to liver disorders, which can be classified into three categories: liver disorders specific to pregnancy, liver disorders non-specific to pregnancy (which can also affect non-pregnant women) and pre-existing liver disorders that can worsen during pregnancy. Jaundice in pregnancy presents a challenge to treating physicians and obstetricians, especially in developing countries like India. Physicians are faced with a wide array of differential diagnoses in managing complications of liver dysfunction. Signs and symptoms are often not specific and consist of icterus, nausea, vomiting, abdominal pain and pruritus. The underlying disorder can have a significant effect on morbidity and mortality in both mother and fetus; hence, the diagnostic workup should be initiated promptly.

**Table 1: Profile of Pregnant women with Jaundice**

| | Age group (years) | No. of Cases (N=100) | Percentage(%) |
|---|---|---|---|
| Age | £30 | 92 | 92 |
| | >30 | 8 | 8 |
| Trimester/post-partum | First | 2 | 2 |
| | Second | 6 | 6 |
| | Third | 84 | 84 |
| | Post partum | 8 | 8 |
| Pregnancy order | First | 50 | 50 |
| | Second | 26 | 26 |
| | Third and above | 24% | 24 |
| Symptoms | Icterus | 100 | 100 |
| | Fever | 40 | 40 |
| | Anorexia | 42 | 42 |
| | Altered sensorium | 26 | 26 |
| | Pain abdomen | 40 | 40 |
| | Vomiting | 60 | 60 |
| | Oliguria | 18 | 18 |
| | Pruritus | 14 | 14 |
| Signs | Pallor | 48 | 48 |
| | Pedal edema | 58 | 58 |

**Table 2: Etiological Profile of Jaundice In Pregnancy**

| Etiological profile | No. of Cases(N=100) | Percentage(%) |
|---|---|---|
| Pih/Hellp | 38 | 38 |
| Viral Hepatitis | 34 | 34 |
| Ihcp | 10 | 10 |
| Sepsis, Mods | 8 | 8 |
| Aflp | 6 | 6 |
| Aih | 2 | 2 |
| CBD Obstruction | 2 | 2 |

**Table 3: Trimester wise etiological Profile Of Jaundice**

| Etiology | Trimester 1 | Trimester 2 | Trimester 3 | Post partum |
|---|---|---|---|---|
| PIH/HELLP | 0 | 0 | 34 | 4 |
| Viral Hepatitis | 2 | 0 | 32 | 0 |
| IHCP | 0 | 2 | 8 | 0 |
| Sepsis, MODS | 0 | 2 | 6 | 0 |
| AFLP | 0 | 0 | 2 | 4 |
| AIH | 0 | 0 | 2 | 0 |
| CBD Obstruction | 0 | 2 | 0 | 0 |

**Table 4: Profile of Liver Disorders**

| | Liver disorder | No. of Cases | Percentage(%) |
|---|---|---|---|
| Specific to pregnancy (n = 54) | PIH/Hellp Syndrome | 38 | 70.4 |
| | IHCP | 10 | 18.5 |
| | AFLP | 6 | 11.1 |
| Nonspecific to pregnancy (n = 44) | Viral Hepatitis | 34 | 77.3 |
| | Sepsis Mods | 8 | 18.2 |
| | CBD Obstruction | 2 | 4.5 |
| Pregnancy complicating pre-existing chronic liver disease (n = 2) | Auto Immune Hepatitis | 2 | 10% |

The etiological factors and incidence of jaundice in pregnancy vary markedly across countries and regions[2]. There are not many comprehensive studies in this region that document these factors. Thus, there is a need for a study to establish the different causative factors responsible for jaundice in pregnancy. Hence, this study was conducted with the objectives of determining the spectrum of etiological factors responsible for jaundice in pregnancy, studying the clinical and laboratory profile of pregnant patients with jaundice and analyzing the distribution of jaundice concerning age, parity and trimesters.

The present study provides a comprehensive analysis of jaundice in pregnant women, highlighting the demographic distribution, clinical presentation and etiological factors. The findings reveal that jaundice predominantly affects younger women, with 92% of the patients being 30 years or younger and the majority (84%) of cases occurring in the third trimester. These results are consistent with previous studies that have documented the higher prevalence of jaundice in the later stages of pregnancy, particularly in younger women[3-5].

Clinically, all patients presented with icterus and vomiting was the second most common symptom (60%), followed by anorexia (42%), fever and abdominal pain (40% each). This symptom profile aligns with the characteristic presentation of liver dysfunction during pregnancy, as described in the literature[6,7]. The presence of altered sensorium in 26% of the cases and oliguria in 18% indicates the severity of the disease, often leading to significant maternal morbidity[8].

Etiologically, PIH/HELLP syndrome was identified as the

leading cause of jaundice, affecting 38% of the patients, followed by viral hepatitis (34%), which is consistent with prior studies[9,10]. Notably, hepatitis B was the most common viral etiology, occurring in 59% of hepatitis cases. This finding underscores the importance of screening and managing hepatitis B in pregnant women to prevent severe outcomes[11-12]. The predominance of PIH/HELLP syndrome in the third trimester and postpartum period (38 out of 42 cases) further emphasizes the critical need for monitoring hypertensive disorders of pregnancy as a risk factor for jaundice[1].

The study also highlights the distribution of liver disorders, with pregnancy-specific conditions such as PIH/HELLP syndrome, IHCP and AFLP comprising 54% of cases. Viral hepatitis and sepsis, which are non-specific to pregnancy, were responsible for 44% of the cases, indicating a significant overlap of hepatic conditions during pregnancy[14-16]. These findings suggest that a multidisciplinary approach is essential for the management of jaundice in pregnancy, particularly in identifying and treating underlying causes to improve maternal and fetal outcomes[17].

## CONCLUSION

This study highlights the significant burden of jaundice in pregnancy, particularly emphasizing the predominance of PIH/HELLP syndrome as the leading cause, followed closely by viral hepatitis. The findings indicate that jaundice most commonly manifests in the third trimester, correlating with the increased incidence of pregnancy-specific liver disorders such as PIH/HELLP and IHCP. The study also underscores the severity of jaundice in cases of acute liver failure, predominantly caused by severe preeclampsia/HELLP syndrome, with a considerable proportion of patients exhibiting elevated bilirubin levels. The trimester-wise analysis further reveals that late pregnancy is a critical period for the onset of these conditions, necessitating heightened vigilance and timely intervention.

However, this study has several limitations. The sample size is relatively small, limiting the generalizability of the findings. The study is also constrained by its retrospective nature, which may introduce selection bias and affect the accuracy of data interpretation. Additionally, the lack of longitudinal follow-up precludes an assessment of long-term maternal and fetal outcomes, particularly in cases of severe jaundice and liver failure. Furthermore, the study did not explore the impact of socio-economic factors, which could play a crucial role in the prevalence and management of jaundice in pregnancy.

Based on these findings, several recommendations can be made. First, there is a need for early screening and monitoring of liver function in pregnant women, especially those in their third trimester or with pre-existing conditions like preeclampsia. Second, multidisciplinary care involving obstetricians, h.epatologists and neonatologists should be emphasized for managing high-risk pregnancies complicated by jaundice. Finally, further research with larger, prospective studies is warranted to better understand the etiological factors, improve early diagnosis and optimize treatment strategies to reduce maternal and fetal morbidity and mortality associated with jaundice in pregnancy.

## REFERENCES


1. Kumari, R. and S. Agrawal, 2016. Incidence of jaundice in pregnancy: A retrospective study. J Obst Gyne India., 66: 239-245.
2. Thapa, B.R. and A. Walia, 2007. Liver function in pregnancy. Indian J Gastr., 26: 70-73.
3. Rashid, J. and K. Farzana, 2015. Jaundice in pregnancy: A clinical study. Pak J Med Sci., 31: 1193-1197.
4. Aggarwal, R., D. Kini, S. Nagpal and S.K. Panda, 2017. Hepatitis B in pregnancy. Indian J Gas., 36: 447-460.
5. James, A.H., M.G. Jamison, M.S. Biswas, L.R. Brancazio and G.K. Swamy,et al., 2009. Acute fatty liver of pregnancy: Risk factors and clinical course. Obstet Gynecol., 114: 225-230.
6. Sibai, B.M., 2007. Imitators of severe preeclampsia. Obstet Gynecol., 109: 956-966.
7. Ch'ng, C.L., M. Morgan, I. Hainsworth and J.G. Kingham, 2002. Prospective study of liver dysfunction in pregnancy in southwest wales. Gut, 51: 876-880.
8. Lee, N.M. and C.W. Brady, 2009. Liver disease in pregnancy. World J Gas., 15: 897-906.
9. Kar, P., S. Singh and M. Wadhawan,et al., 2008. Maternal and fetal outcomes in pregnant women with acute hepatitis E virus infection. Ann. Internal Med., 150: 84-89.
10. Chen, J., Y. Han and Q. Gong, 2016. Pregnancy outcomes in women with chronic hepatitis B infection: A retrospective cohort study. BMC Preg Child., Vol. 16, No. 87.
11. Geenes, V. and C. Williamson, 2009. Intrahepatic cholestasis of pregnancy. World J Gastr., 15: 2049-2066..
12. Castro, M.A., M.J. Fassett, T.B. Reynolds, K.J. Shaw and T.M. Goodwin, 1999. Reversible peripartum liver failure: A new perspective on the diagnosis, treatment, and cause of acute fatty liver of pregnancy, based on 28 consecutive cases. Am. J. Obstet. Gynecol., 181: 389-395.
13. Audu, B.M., I.U. Takai, M. Bukar and A.A. Kullima, 2009. Acute fatty liver of pregnancy: A

retrospective analysis of 27 cases in Nigeria. Ann Afr Med., 8: 48-51.
14. Tran, T.T., J. Ahn and N.S. Reau, 2016. Acg clinical guideline: Liver disease and pregnancy. Am. J. Gastr., 111: 176-194.
15. Westbrook, R.H., G. Dusheiko and C. Williamson, 2016. Pregnancy and liver disease. J Hep., 64: 933-945.
16. Bacq, Y., O. Zarka, J. Brechot, N. Mariotte, S. Vol, J. Tichet and J. Weill, 1996. Liver function tests in normal pregnancy: A prospective study of 103 pregnant women and 103 matched controls. Hepatology, 23: 1030-1034.
17. Knight, M., P.C. Nelson, J.J. Kurinczuk, P. Spark and P. Brocklehurst, 2008. A prospective national study of acute fatty liver of pregnancy in the UK. Gut., 57: 951-956