



## MATERNAL AND FETAL OUTCOMES OF JAUNDICE DURING A COMPLICATED PREGNANCY IN TERTIARY CARE HOSPITAL IN KAKINADA DISTRICT: A PROSPECTIVE OBSERVATIONAL STUDY

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**ABSTRACT** **Background:** Viral hepatitis is one of the most common and potentially serious infections that can occur in pregnant women. Liver disease in pregnancy, although rare, can seriously affect the mother and fetus. Physiological changes of a normal pregnancy can be confounding with the sign and symptoms of liver diseases. But it is an essential medical disorder because it has adverse effects on the mother and fetus like PPH, preterm labour, IUD, fetal distress, etc. This study aims to analyze the incidence, demographics, obstetric profile, and causes of jaundice in pregnancy and to know the maternal and fetal outcomes. **Materials And Methods:** This is an observational study conducted by the Department of Obstetrics and Gynaecology, Governments General Hospital (tertiary care hospital) Kakinada, East Godavari District, Andhra Pradesh. 54 antenatal patients with clinical/laboratory evidence of jaundice were selected for the study between January 2020 to December 2020. **Results:** The mean (Standard deviation) age of patients was  $25.5 \pm 5.4$ . 54 patients had jaundice during pregnancy were analysed. 77% of the patients were between 21 and 35 years old. Most cases were Primi gravida. The incidence of jaundice was 3.7%. The most common cause of jaundice was hemolysis, elevated liver enzymes, and low platelets (HELLP). The most common maternal complication was disseminated intravascular coagulation. The maternal mortality rate was eight. The majority of perinatal outcomes were preterm births. **Conclusions:** Jaundice in pregnancy has adverse fetomaternal consequences. Improving health awareness, education, regular prenatal examinations, and early referrals lead to early diagnosis and treatment of jaundice during pregnancy, thereby reducing maternal and fetal mortality and morbidity.

**KEYWORDS :** Maternal, Viral Hepatitis, Fetal outcome, Jaundice in Pregnancy.

### INTRODUCTION:

In 2017, pregnancy and childbirth problems claimed the lives of around 810 women worldwide every day.<sup>1,2</sup> In Sample Registration System (2018-2020) it is reported that the Maternal Mortality Ratio (MMR) is 97 deaths per one million live births in India.<sup>3</sup> The majority of maternal deaths occur in low-middle-income nations, which account for 94% of all maternal deaths.<sup>4</sup> Liver dysfunction during pregnancy is multifactorial and difficult to diagnose. Jaundice affects a small percentage of pregnant women, but it takes a heavy toll on maternal and fetal health, especially in developing countries like India. Jaundice in pregnancy has a severe prognosis for maternal and fetus and is responsible for 10% of maternal deaths.<sup>5</sup> It could be typical of pregnancy, such as acute fatty liver pregnancy, recurrent cholestatic jaundice of pregnancy, and jaundice complicating toxemia. It can be simultaneously with pregnancy, for example, due to an infective pathology such as viral hepatitis or gallstone, or it could occur due to drugs administered during pregnancy. The key to maternal and fetal well-being is early diagnosis and appropriate management. Fulminant hepatitis E has the highest mortality rate at 22%, followed by the acute fatty liver of pregnancy at 18%.<sup>6,7</sup>

Jaundice is a clinical manifestation of hyperbilirubinemia.<sup>8</sup> This causes yellowish discoloration of the skin and mucous membranes. In adults, the normal serum bilirubin concentration is less than 1 mg/dl. However, clinical jaundice does not manifest until serum bilirubin concentration is 2 mg/dl. A normal pregnancy itself is a mild cholestatic condition. During pregnancy, other liver function tests (serum levels of bilirubin, ALT, AST) are unchanged, with the exception of increased alkaline phosphate (ALP) values. ALP is physiologically produced by the placenta.

Hepatitis A remains a significant cause of sporadic acute viral hepatitis in young adults in southern India.<sup>9</sup> Viral hepatitis, particularly fecal-oral hepatitis E infection is fairly common in lower socio-economic, densely populated areas of urban slums lacking basic hygiene, with a seasonal increase in incidence during summer and monsoon seasons. The present study analyzes demographics, etiology of jaundice, the incidence in pregnancy, and its fetal-maternal outcome. This study will be helpful in better understanding and improving the maternal and perinatal outcomes of jaundice, which complicates the pregnancy.

### MATERIALS AND METHODS:

**Study Setting:** This study was conducted in the Department of Obstetrics and Gynecology of Government General Hospital, Kakinada, East Godavari district. **Study design:** The Prospective observational study was adopted. **Study participants:** Pregnant women with abnormal liver function tests within one year. **Inclusion criteria:** All booked, Unbooked, and referral cases with abnormal liver function tests were included in this study. **Exclusion criteria:** The Pregnant women were not willing to give consent. **Study period:** The study was conducted from January 2020 to December 2020. **Data collection technique:** This study included 54 prenatal women with jaundice who were admitted to the Department of Obstetrics and Gynecology at Government General Hospital for a one-year study period. All patients underwent a detailed medical history, and a general systemic examination, as well as a complete obstetric examination. Investigations, include liver function tests (total serum bilirubin, direct and indirect values, serum transaminases, serum alkaline phosphate, total proteins, albumin, globulin levels), coagulation profile, clotting time, bleeding time, complete blood count with the peripheral swab, viral markers including HBsAg, HCV, anti-HCV Abs, anti-HAV IgM, anti-HEV IgM were performed on all prenatal women with jaundice. In addition, a detailed ultrasound examination was carried out. **Statistical analysis:** Data analysis was performed using IBM SPSS. 20 (Statistical Package for Social Science ver.20). The categorical variables are presented as percentages or proportions. Continuous variables are presented as mean and standard deviation. Demographics (age, socio-economic status, and residence), obstetrics profile (gravida, booked/Unbooked case), etiology, complications, maternal morbidity and mortality, and fetal outcome were analyzed and compared with similar studies.

### RESULTS:

The total number of antenatal admissions in the department during this one-year study period was 16,236. The total number of antenatal women with jaundice admitted during the study period was 54. The mean age (standard deviation) was  $25.5 \pm 5.4$ . Table 1 shows the peak age of incidence between 21 – 35 years 77.8% and 25% were of lower socioeconomic status, and 45% were rural. The majority of pregnant women were Unbooked, 72.2%. The majority of patients were Primi gravida 50%. Most patients were diagnosed with jaundice in the third

trimester 79.7%, followed by the second trimester 16.7%, and the first trimester 3.7%.

**Table 1: Sociodemographic Profile Of Patients (N=54):**

Age in years	Number of Cases n (%)
17 - 20 years	8 (14.8)
21-35 years	42 (77.8)
36 - 40 years	4 (7.4)
<b>Residence</b>	
Urban	9 (16.7)
Rural	45 (83.3)
<b>Socio-economic status</b>	
Lower middle class	8 (14.9)
Upper lower class	21 (38.9)
Lower class	25 (46.3)
<b>Booking status</b>	
Unbooked	39 (72.2)
Booked	15 (27.8)
<b>Gravidity</b>	
Primi gravida	27 (50)
Second gravida	16 (29.6)
Third gravida	9 (16.7)
Fourth gravida	2 (3.8)
<b>Gestational age</b>	
1 <sup>st</sup> trimester	2 (3.7)
2 <sup>nd</sup> trimester	9 (16.7)
3 <sup>rd</sup> trimester	43 (79.7)

Table 2 shows the liver function test. Out of 54 patients, the majority of patients, 37%, had serum total bilirubin 2-4mg%. Serum transaminase was 80-100IU/L, and the patients had 51.9%. 25.9% of the patients had more than 400IU/L. The majority of patients had 201 – 800mg%, which was 50%.

**Table-2: Liver Function Tests Of Cases (N=54):**

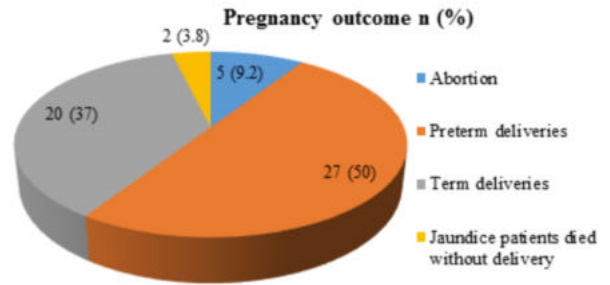
Serum total bilirubin	Number of Cases n (%)
2-4mg%	20 (37)
4.1-6mg%	13 (24.1)
6.1-10mg%	12 (22.2)
10.1-14mg%	5 (9.2)
>14.1mg%	4 (7.4)
<b>Serum transaminase</b>	
80-100 IU/L	28 (51.9)
101-400 IU/L	12 (22.2)
>401 IU/L	14 (25.9)
<b>Serum alkaline phosphatase</b>	
<200mg%	25 (46.3)
201-800mg%	27(50)
>801 mg%	2 (3.7)

Table 3 shows the etiology of jaundice in pregnancy. HELLP was the most important cause of jaundice in this study in 42.6% of cases. The Second most common cause was viral hepatitis 18.5%, followed by intrahepatic cholestasis of pregnancy 7.4% and transfusion reactions 7.5%, AFLP 5.5%, sickle cell anemia 5.5% malaria 3.7%, sepsis 3.7%, and gilbert syndrome 1.8%.

**Table 3: Etiology Of Jaundice In Pregnancy (N=54):**

Diagnosis	Number of Cases n (%)
HELLP syndrome	23 (42.6)
Hepatitis	10 (18.5)
Intrahepatic cholestasis of pregnancy	4 (7.4)
Transfusion reactions	4 (7.4)
AFLP	3 (5.56)
Sickle cell anemia	3 (5.56)
Malaria	2 (3.7)
Sepsis	2 (3.7)
Gilbert syndrome	1 (1.8)
Undetected	2 (3.7)

Figure 1 shows the pregnancy outcome of the cases. Out of 54 patients, the majority had preterm births, 50%, followed by term births, 37%, and abortions, 9.2%. Jaundice patients died without delivery 3.8%.



**Figure 1: Pregnancy outcome of cases (N=54):**

Table 4 shows maternal complications of jaundice during pregnancy. Post-partum hemorrhage (PPH) was the most common complication in 29.6% of patients. Abruption of the placenta was 16.6%, DIC 11.1%, hepatic-renal failure 9.2%, and hepatic encephalopathy 7.4%. Uncomplicated jaundice in pregnancy was 11.1%.

**Table-4: Maternal Complications of jaundice in Pregnancy (N - 48):**

Complications	Number of cases n (%)
PPH	16 (29.6)
Abruption of placenta	9 (16.6)
DIC	6 (11.1)
Hepatic-renal failure	5 (9.2)
Hepatic encephalopathy	4 (7.4)
HELLP	4 (7.4)
Hepatitis	2 (3.7)
Sepsis	2 (3.7)

Table 5 shows maternal mortality due to jaundice in pregnancy. In our study, there were eight maternal deaths due to DIC 2 (25%), HELLP 2 (25%), hepatic encephalopathy 1(12.5%), hepatic encephalopathy 1 (12.5%), sepsis 1 (12.5%), and hepatitis 1 (12.5%).

**Table-5: Maternal Mortality Of Jaundice In Pregnancy (N=8):**

Cause of death	No. of cases n (%)
DIC	2 (25)
HELLP	2 (25)
Hepatic encephalopathy	1 (12.5)
Hepatitis	1 (12.5)
Sepsis	1 (12.5)
Hepatic renal failure	1 (12.5)

Table 6 shows the perinatal outcome. Out of 54 patients, 35 patients had live births, 19 patients (38.7%) pre term and 16 patients (32.6%) at term. Of 14 patients Intrauterine deaths (IUD)/stillbirths, 8 patients (16.3%) had delivered preterm and 6 patients (12.2%) had delivered at term. Of 54 patients, 5 had abortions and were excluded from the calculation of the perinatal outcome.

**Table-6: Perinatal Outcome Of Cases (N=49):**

Perinatal outcome	Number of Cases n (%)
<b>Live births</b>	
Term	16 (32.6)
Pre term	19 (38.7)
<b>IUD/stillbirths</b>	
Term	6 (12.24)
Preterm	8 (16.33)

**DISCUSSION:**

Liver dysfunction in pregnancy is associated with various pathologies including viral hepatitis, HELLP, acute fatty liver disease, sickle cell anemia, malaria, sepsis, Gilbert's syndrome. The incidence of pre-eclampsia in pregnancy is 2-8% worldwide.<sup>10</sup> In our present study, the mean age ± standard deviation. In the study, a majority of 50% Primi gravida and 79% of the pregnancy were diagnosed with third trimester of jaundice. The most common causes of jaundice in pregnancy in our study were HELLP syndrome 42.6%, hepatitis 18.5%, intrahepatic cholestasis of pregnancy (7.41%), acute fatty liver of pregnancy (5.6%), and others. When it comes to other liver diseases that occur during pregnancy, there are large geographic variations.

In developed countries like the US, gallstones and pre-eclampsia are the most common cause of liver dysfunction.<sup>11</sup> While in developing countries like India viral hepatitis is on the rise. This is mainly due to poor sanitation and lack of clean drinking water, through which

hepatitis spreads. In our study, 78% were in the 20-35 years age group and 42% in the upper lower class. Similar findings were reported by other parallel studies.<sup>5,12</sup> Preeclampsia is more common in primigravidae with a relative risk of 2.91.<sup>13</sup> Overcrowding, contaminated drinking water, poor sanitation management and unawareness of basic hygiene habits predispose the lower socio-economic group to infectious cause of hepatitis like hepatitis E, hepatitis A, malaria.

Jaundice in pregnancy is associated with high maternal and perinatal mortality rates. In present study found that the most common maternal complications were PPH (29%) followed by abruption of placenta (16%), DIC (11%), hepato-renal failure (9%), and hepatic encephalopathy (7%). The maternal mortality rate in our study is 14.8%. Out of 8 deaths, 2 had disseminated intravascular coagulation (DIC), 2 had HELLP, and the remaining 4 died from sepsis, liver failure, hepatic encephalopathy, and hepatitis, respectively. Maternal deaths were directly proportional to serum bilirubin levels as reported by Trivedi et al.<sup>14</sup> observed in his study. In our study, the perinatal mortality rate was 28.5%, similar to that reported by Fisk, 22 to 44%.<sup>15</sup> High perinatal mortality rate of 45.4% was observed.<sup>16</sup> The factors responsible for high maternal mortality in our country were poor nutrition, prevalence of anemia, delay in seeking health care, and delay in referral to the health facility, delay in decision making. Limitations of our study include that this was a hospital based study with a limited sample size. A large prospective study on this topic would throw further light on the disease pattern and outcome of jaundice in pregnant women. However, further studies are needed to explore the pathogenesis of AFLP. A better understanding of the features of AFLP will aid in its timely diagnosis and treatment, including prompt termination of pregnancy, thus helping increase the cure rate, reduce mortality, and improve pregnancy outcomes.

## CONCLUSION

Our present study re-emphasises the fact that there is increased maternal and fetal morbidity and mortality in pregnancies complicated by jaundice and therefore early interventions such as timely initiation, PPH prophylaxis, ensuring the availability of adequate blood products to overcome it are associated. Improving health awareness, education, regular prenatal checkups, and early referrals lead to early diagnosis and treatment of jaundice during pregnancy. Jaundice of pregnancy should be managed as a team in collaboration with obstetrics, internal medicine, gastroenterology, anesthesia and critical care so that aggressive management can prevent and reduce fetomaternal morbidity and mortality.

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**Conflict Of Interest:** Not declared

**Ethical Approval:** The study was approved by the Institutional Ethics Committee.

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