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## **An Observational Study of Outcomes in Pregnancy Associated with Abnormal Liver Function Test**

**Deepa Retnamma Babu \***, **Priyanka K Dapper\***, **Sujatha Prabhu\*\***

\* Junior Resident, \*\*Professor,

Department of OBG, ESIC MC and PGIMSR, Bangalore, Karnataka, India

**\*Corresponding Author**

Email id- babu.deepa17@gmail.com; priyankakdapper@gmail.com

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### **ABSTRACT**

**Introduction:** Liver diseases in pregnancy complicates 3-5% of pregnancies worldwide. Physiological changes in the liver function test are often mild and transient but a pathological derangement in the liver function test necessitates prompt evaluation as they can pose a great threat to maternal and fetal wellbeing.

**Aims And Objectives:** To detect the incidence of deranged LFT in pregnancy, the etiology and on the subsequent work-up according to the time of onset and the fetomaternal outcome.

**Materials And Methodology:** The present study was conducted in the Department of Obstetrics and Gynecology, ESI Medical College and PGIMSR, Bangalore, from January 1<sup>st</sup> to August 31<sup>st</sup> 2022. All pregnant women with abnormal liver dysfunction admitted during the study period were included in the study

**Results:** The incidence of deranged LFT in pregnancy in our study is 2%. 90% of the cases presented in the third trimester with the most common etiology being hypertensive disorders of pregnancy attributing to 57% followed by viral hepatitis (34%). Other causes included hyperemesis gravidarum (3%), complicated malaria (3%) and CLD (3%). Maximum deviation in the LFT was attributed to viral hepatitis. 67% cases underwent Emergency LSCS with the most common indication being fetal distress. Term vaginal delivery occurred in 22% cases and preterm vaginal delivery occurred in 11%. Preterm babies attributed to 67% and NICU was required in 63% cases.

**Conclusion:** Deranged liver function test is most commonly attributed to Pregnancy-specific disorders such as preeclampsia and particularly present in the third trimester. A systematic approach to these cases can help in prompt diagnosis and holistic management to reduce the fetal and maternal morbidity.

**Key Words:** Liver diseases; Preeclampsia; CLD; Hyperemesis Gravidarum; AFLP; NICU

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### **INTRODUCTION**

Liver diseases in pregnancy is an uncommon condition, complicating around 3-5% of pregnancies worldwide [1]. Physiological changes that occur during pregnancy may at times mimic signs and symptoms of liver disease. Typical clinical features of liver disease such as palmar erythema and spider naevi may be a normal finding in a pregnant woman resulting from a hyperestrogenic state. Increased level of progesterone promotes hypomotility of the gallbladder, resulting in increased incidence of cholelithiasis among pregnant women [2]. Decrease in the total protein and serum albumin levels stemming from hemodilution that results in pedal edema and a 3-fold increase in the Alkaline phosphatase are common and non-specific findings in pregnancy.

Physiological changes in the liver function test are often mild and transient. In contrast to these, a pathological derangement in the liver function test with an elevation in the serum

total bilirubin, direct bilirubin, liver enzymes- transaminases (AST and ALT) or prothrombin time above the normal range, necessitates a prompt evaluation [3].

Pregnant women with suspected liver disease presenting with deranged LFT can be broadly classified into 3 types:

- 1) Liver disorders exclusively seen in and associated with pregnancy which includes hyperemesis gravidarum, acute fatty liver of pregnancy, intrahepatic cholestasis, preeclampsia, HELLP syndrome.
- 2) Hepatobiliary disease occurring during pregnancy such as viral/drug induced hepatitis, cholelithiasis.
- 3) pregnancy in patients with pre-existing chronic liver disease such as chronic hepatitis, cirrhosis, Budd Chiari syndrome [1].

Pregnancy related liver disease is the most common cause of liver dysfunction in pregnancy and can pose a great threat to both the maternal and fetal wellbeing [3].

The present study aims to detect the incidence of deranged LFT in pregnancy, the etiology and on the subsequent work-up according to the time of onset and the fetomaternal outcome.

## **MATERIALS AND METHODOLOGY**

### **Source of the Data**

The present study was a retrospective observational study, conducted in the Department of Obstetrics and Gynecology, ESI MEDICAL COLLEGE AND PGIMSR, Rajajinagar, Bangalore, over a period of 7 months from January 1<sup>st</sup> 2022 to August 31<sup>st</sup> 2022.

### **Inclusion Criteria**

All pregnant women with abnormal liver function admitted during the study period, in the obstetric unit of hospital were studied prospectively, and 30 such women were included in the study.

The demographic, menstrual and obstetric details, the presenting symptoms, and specific symptoms related to liver dysfunction such as pruritus, persistent vomiting, yellowish discoloration of urine and eyes, blurring of vision, diminished urine output and upper abdominal discomfort and intake of any hepatotoxic drug and transfusion history were obtained.

A thorough general and obstetric examination was carried out in all. In all cases with suspected liver disorder, PIH profile and Serology was ordered. These women were followed up either till delivery and along with their neonates, up to 7-day post-partum or until the LFT returned to normal.

The data was entered into Microsoft Excel Datasheet and was analyzed using SPSS 22 version software. Categorical data was represented as frequencies and proportions. Diagnostic criteria for different underlying pathologies were based upon following parameters [5].

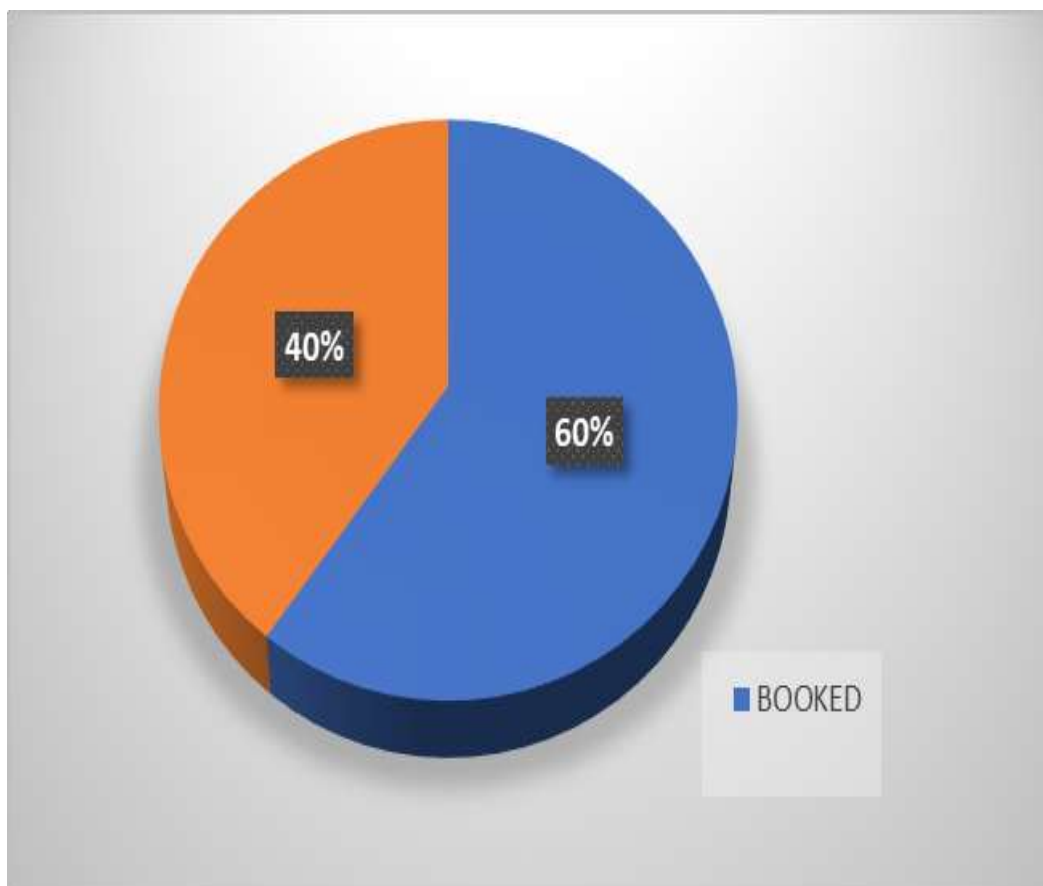
- 1) HELLP syndrome: complete: raised bilirubin, elevated AST (>70 IU/L), low platelet count (<100,000/ $\mu$ L), hemolysis (suggestive peripheral smear with red cell fragmentocytes along with increased reticulocytes).

Partial: elevated AST (>40 IU/L), low platelet count (<150,000/ $\mu$ L), the absence or presence of hemolysis.

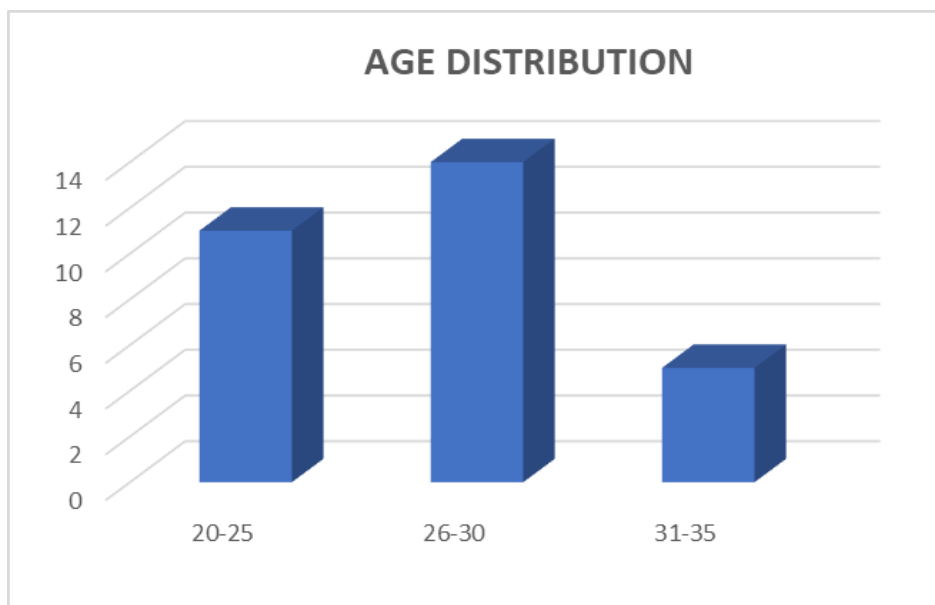
- 2) Pre-eclampsia-associated liver dysfunction: Elevated transaminases or bilirubin in the presence of hypertension to the extent of 140/90 mmHg or more on two occasions >6 h apart, proteinuria (1+) after 20 weeks of pregnancy.
- 3) Intrahepatic cholestasis of pregnancy (ICP): Pruritus without any skin problem or allergy with elevated transaminases. Relieved after delivery.
- 4) Acute Fatty Liver of Pregnancy (AFLP) Six or more of the following—vomiting, abdominal pain, polydipsia or polyuria, encephalopathy, leucocytosis, elevated bilirubin, elevated transaminases, marked hypoglycaemia, renal impairment, coagulopathy, elevated urate, ascites or bright liver on ultrasound.
- 5) Hepatitis: elevated transaminases or bilirubin in the presence of positive hepatitis viral serology.

## RESULTS

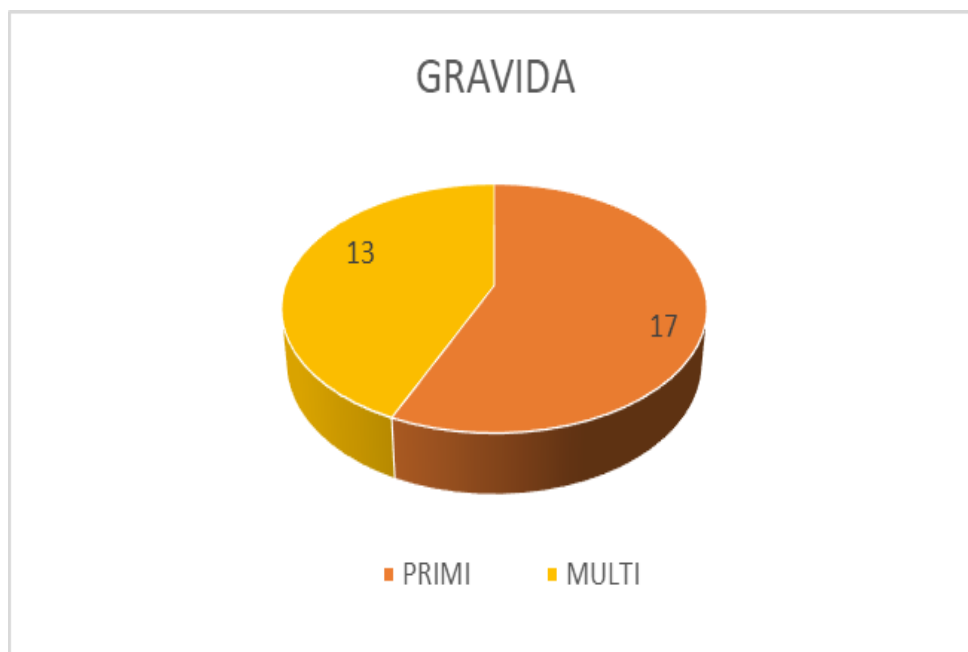
A total of 30 cases meeting the inclusion criteria amongst 1450 admissions in the study period were detected to have abnormal liver function test, giving an incidence of 2% in our study. 60% of the cases were booked cases at ESI hospital, aged between 20-35 years, with majority of the patients in the age group of 26-30 years. 57% of the patients were Primi gravida.



*Figure 1. Distribution of booked cases*



*Figure 2. Distribution of study subjects as per age.*



*Figure 3. Distribution based on Parity*

90% of the cases presented in the third trimester with the most common etiology being preeclampsia attributing to 40% cases followed by hepatitis including viral /autoimmune hepatitis (34%). Other causes included gestational hypertension (10%), partial HELLP (7%), hyperemesis gravidarum (3%), complicated malaria (3%) and CLD (3%).

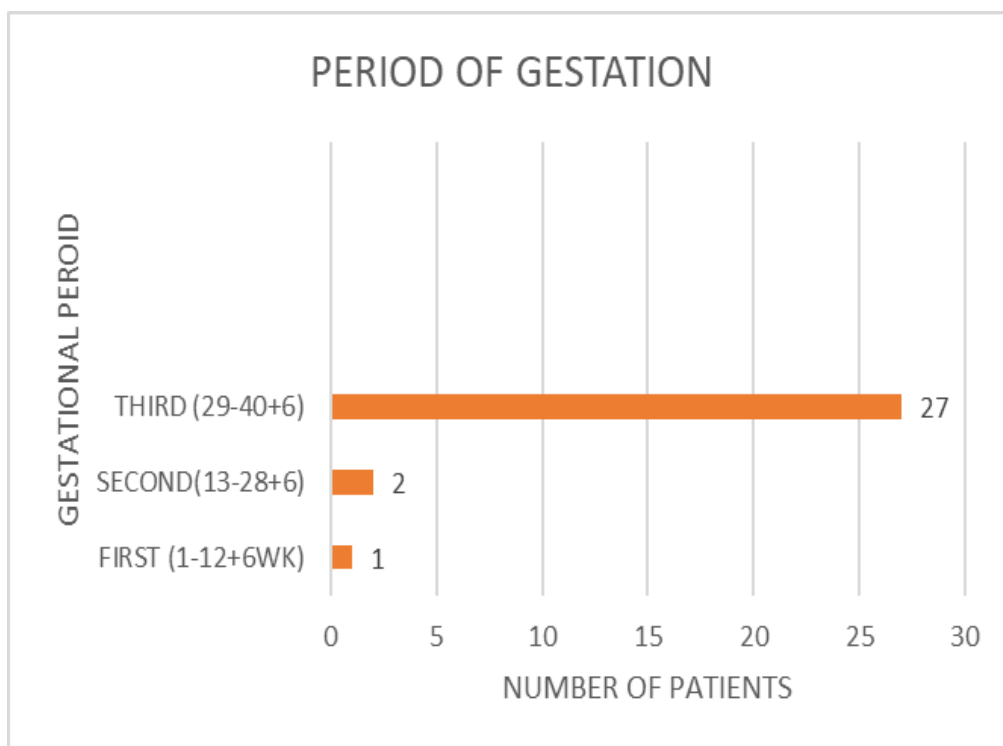


Figure 4. Distribution based on Period of gestation at presentation

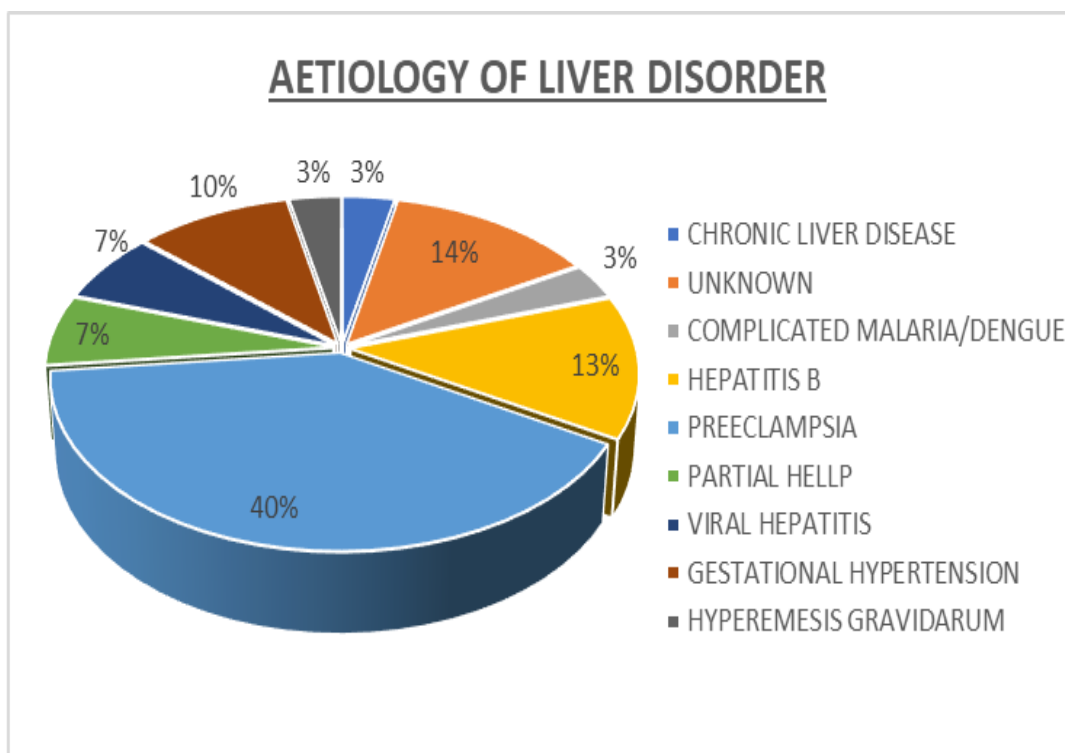


Figure 5. Distribution based on underlying aetiology of liver disorder

The most common presenting complaint included pedal edema (47%), labour pain (27%), yellowish discoloration of eyes (17%), pruritis (3%), fever (6%).

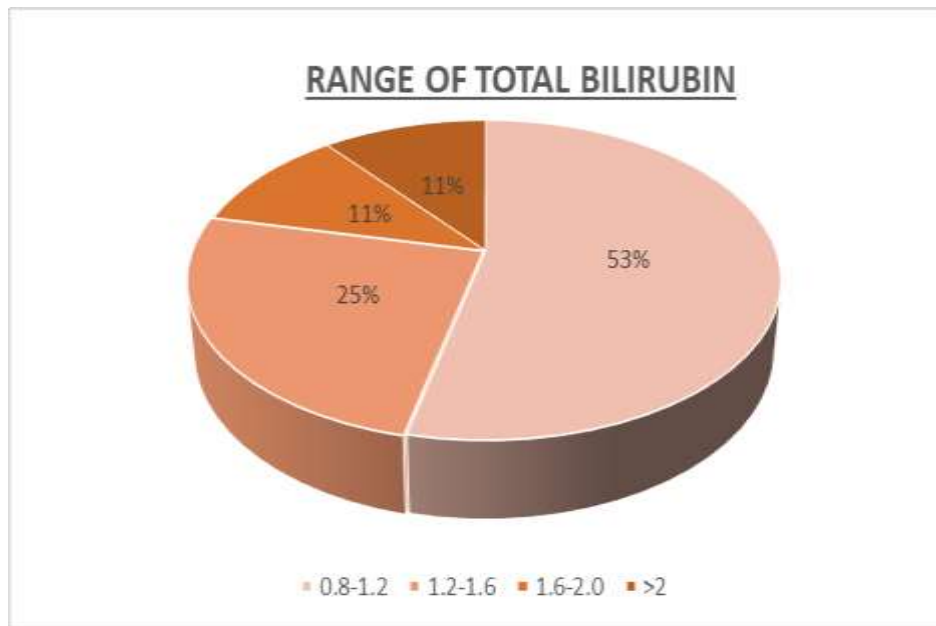


Figure 6. Distribution based on range of total bilirubin

Majority of the cases had a serum bilirubin ranging between 1.2-1.6mg%, and only 11% cases had a serum bilirubin >2mg%. The maximum level of serum bilirubin of 6mg% was seen in one case. Among the various abnormalities in the LFT, majority of the patients presented with elevation in liver enzymes- AST elevation of <100 IU/L -64% of cases ,ALT elevation <100 IU/L-70%. AST and ALT elevation >100 IU/L-10% and elevation >500IU/L-3%. Maximum deviation from normal range in the LFT were attributed to Hepatitis including viral hepatitis and autoimmune hepatitis, followed by CLD and complicated malaria and then by preeclampsia, Gestational hypertension and partial HELLP syndrome.

## PREGNANCY OUTCOME

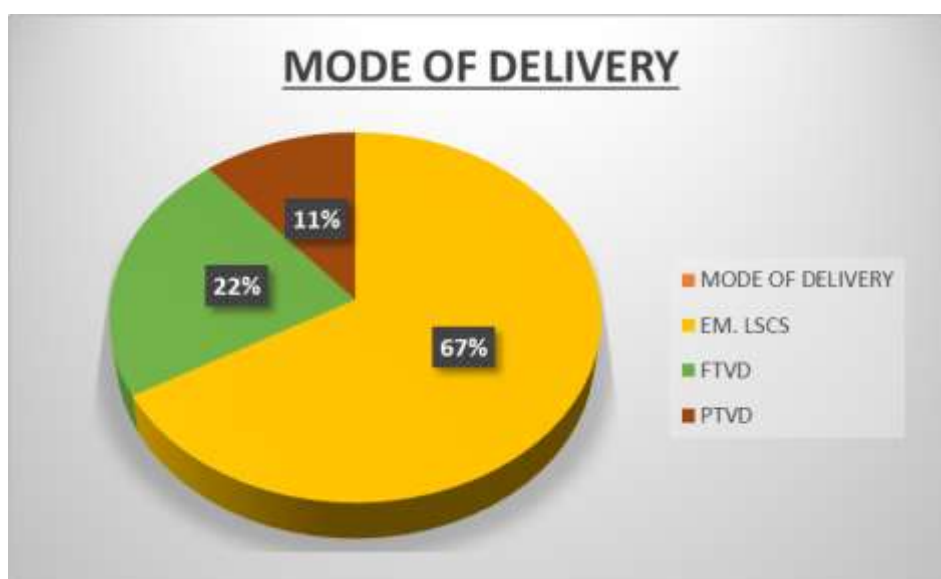


Figure 7. Distribution based on Mode of delivery

Of the 27 patients that presented in the third trimester -67% underwent Emergency LSCS with the most common indication being fetal distress in (56%) followed by eclampsia (7%) and failed induction (7%). Term vaginal delivery occurred in 22% cases following induction with Cerviprime gel. And preterm vaginal delivery occurred in 11%.

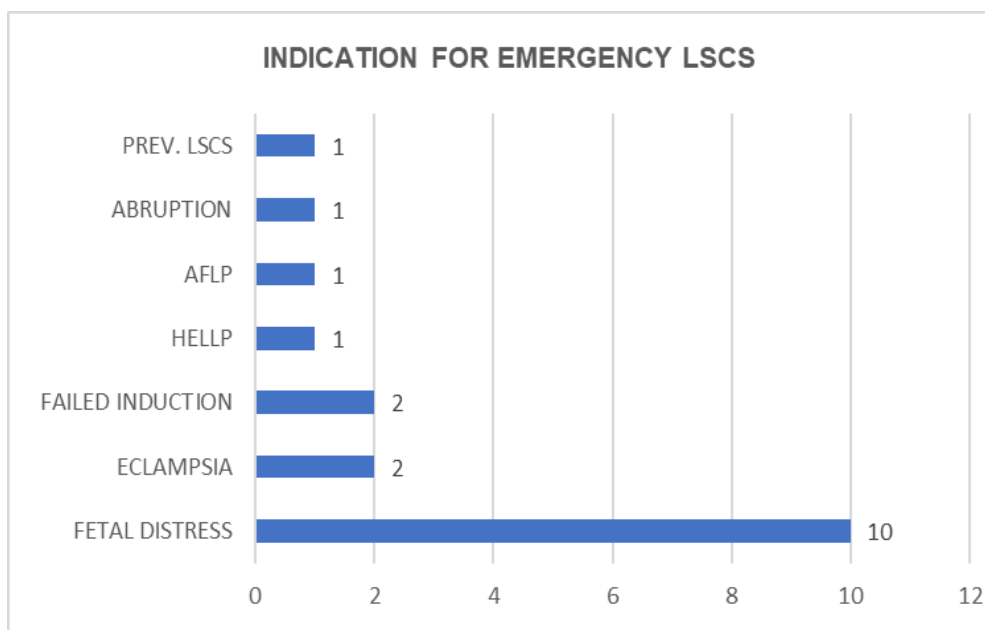


Figure 8. Distribution based on Indication for Caesarean delivery

### MATERNAL COMPLICATIONS (INTRANATAL AND POSTNATAL)

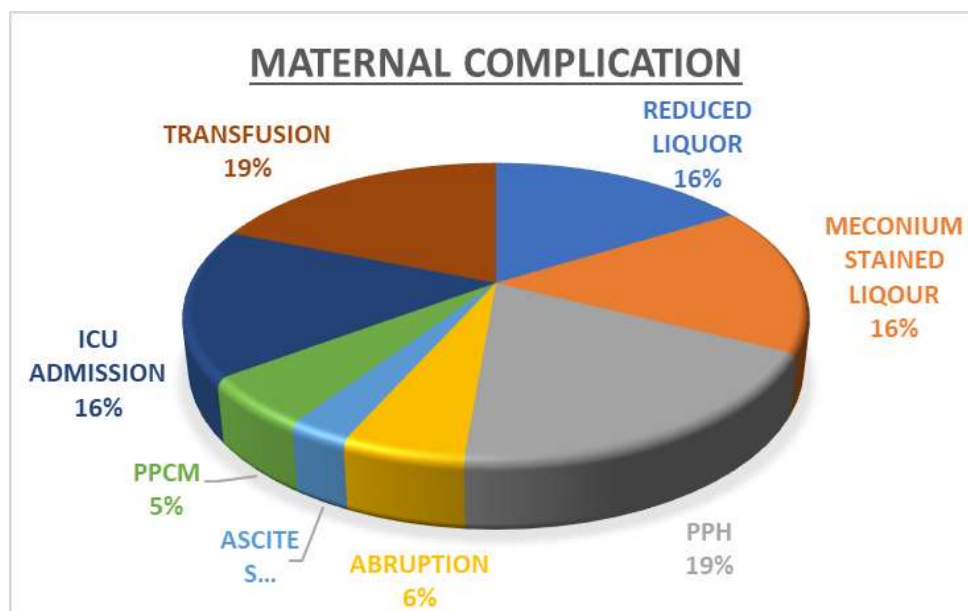


Figure 9. Distribution based on maternal complications

The most common postpartum complication was postpartum hemorrhage necessitating blood and blood product transfusion in 19% cases. 16% patients required ICU admission. Other complications included abruption (6%), postpartum cardiomyopathy(5%). 16% cases had

meconium stained liquor intrapartum, 6% had abruption and 2% had ascites detected intrapartum.

## NEONATAL OUTCOME

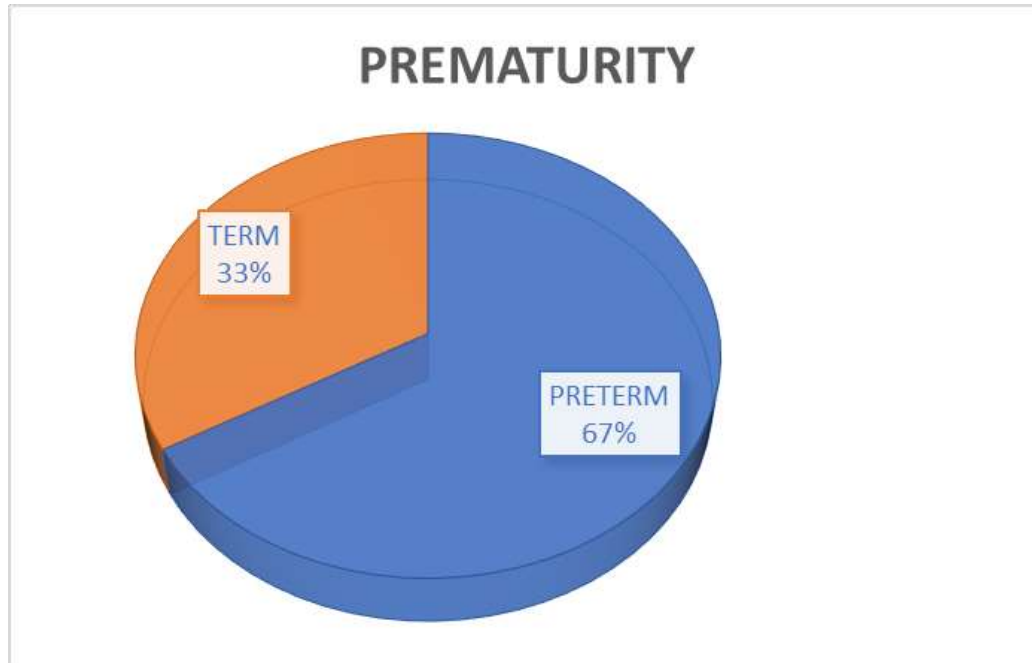


Figure 10. Distribution based on preterm delivery

67% of the babies were preterm babies and NICU admission was required in 63% cases with the most common cause of admission being respiratory distress (47%), necessitating ventilatory support in 12% cases. Other causes included severe prematurity (7%) and low birth weight (46%).

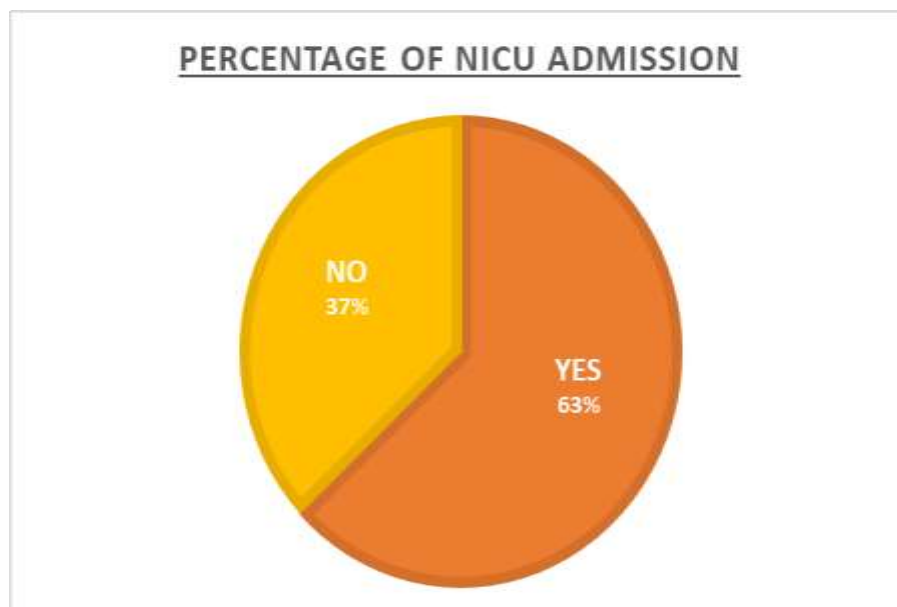
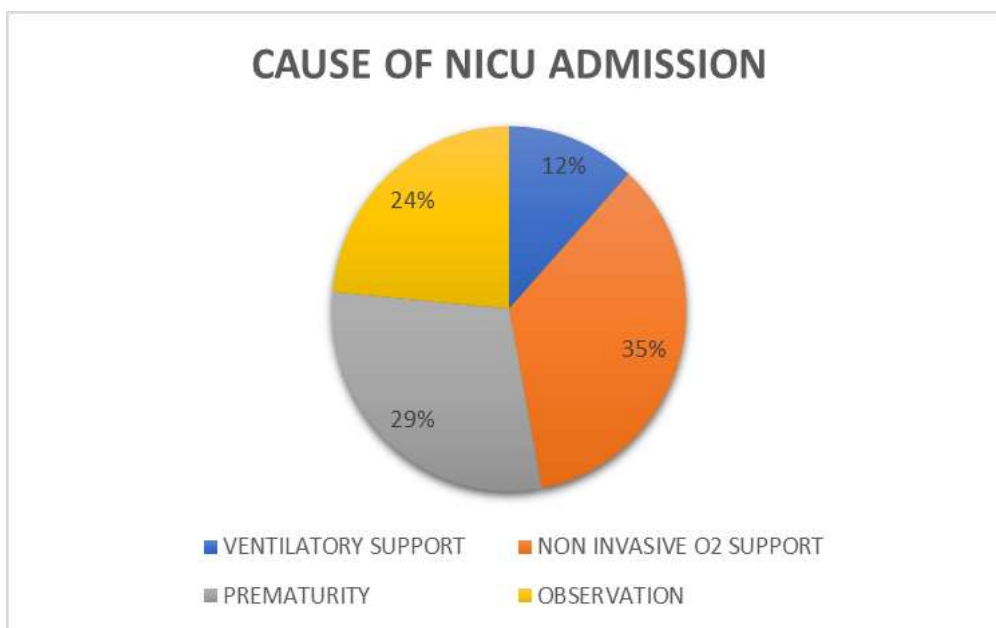
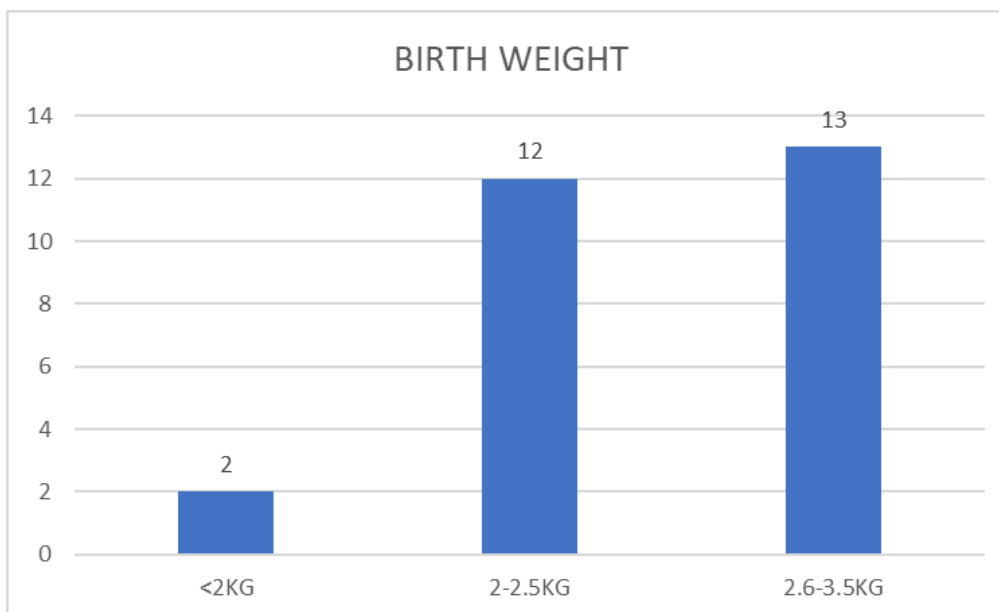


Figure 11. Distribution based on percentage of NICU admission



*Figure 12. Distribution based on cause of NICU admission*



*Figure 13. Distribution based on Birth weight*

## DISCUSSION

Though uncommon a pregnancy that is complicated by a liver disease can result poor maternal and fetal outcome. The average incidence of the condition in this study is similar to those obtained in other studies [1]. Majority of the cases with deranged LFT was noted in the third trimester (90%) and the most common etiology was preeclampsia in 40% cases, which was similar to the findings obtained in the study conducted by Sumangali PK, Kurian S in 2017 [5]. The causes of deranged liver function test can be understood based on the trimester of presentation. Hyperemesis gravidarum is the cause in 1<sup>st</sup> trimester presentation. Deranged LFT in the second trimester the causes of are co-incidental and nonspecific, whereas liver

disorders specific to pregnancy which constitute preeclampsia in majority, HELLP, AFLP, and IHC are seen in the 3<sup>rd</sup> trimester [5]. Pregnancy related disorders resulting in deranged LFT attributed to 60% cases in our study which is similar to the incidence of 67-80% obtained in other studies. Of these disorders Preeclampsia was the most common cause followed by gestational hypertension and HELLP. AFLP has a rare incidence of 1:7000 to 1:16000, presenting in the third trimester. Our study included one case of AFLP (3%) that presented at 35 weeks. Infective hepatitis contributed as the cause for maximum deviation from normal in the liver transaminases (AST & ALT)-100-600IU/L. Whereas liver enzymes twice the normal range but <100IU/L was noted in cases of preeclampsia and gestational hypertension [6]. In cases of hypertensive disorders of pregnancy elevation in the serum LDH and uric acid and associated thrombocytopenia noted in our study was similar to other studies. Increased maternal risk of meconium-stained liquor, PPH and ICU admissions and fetal risks of prematurity and respiratory distress was similar to other studies [7].

## CONCLUSION

Deranged liver function test is most commonly attributed to Pregnancy-specific disorders particularly presenting in the third trimester. Pre-eclampsia-related disorder is the commonest amongst these. A systematic approach to these cases, understanding the gestational age at presentation, associated signs and symptoms, and degree of variation the parameters of liver function test can help in prompt diagnosis and holistic management to reduce the fetal and maternal morbidity.

## REFERENCES

- 1) Guarino M, Cossiga V, Morisco F. The interpretation of liver function tests in pregnancy. *Best Practice & Research Clinical Gastroenterology*. 2020 Feb 1;44:101667
- 2) Shekhar S, Diddi G. Liver disease in pregnancy. *Taiwan J Obstet Gynecol*. 2015;54:475–82
- 3) Westbrook RH, Dusheiko G, Williamson C. Pregnancy and liver disease. *J Hepatol*. 2016;64:933–45
- 4) Ching LY, Barge N, Dalal AR. Study of jaundice in pregnancy in a tertiary care Institute in India. *Bombay Hosp J*. 2011;53(2):181–3
- 5) Sumangali PK et al. *Int J Res Med Sci*. 2017 Dec;5(12):5193-96
- 6) Beniwal M, Kumar A, Kar P, et al. Prevalence and severity of acute viral hepatitis and fulminant hepatitis during pregnancy: a prospective study from north India. *Indian J Med Microbiol*. 2003;21:184–185
- 7) Tank PD, Nandanwar YS, Mayadeo NM. Outcome of pregnancy with severe liver disease. *Int J Gynecol Obstet*. 2002;76:27–31. doi: 10.1016/S0020-7292(01)00562-8