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## Original Research Article

## Nocuous liver diseases in pregnancies during the covid pandemic

Pentakota Venkata Gowri Priyanka<sup>1,\*</sup>, Janaki Vellanki<sup>1</sup><sup>1</sup>Dept. of Obstetrics and Gynecology, Gandhi Hospital, Secunderabad, Telangana, India

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## ABSTRACT

**Background:** Liver disease in pregnancy has always been a challenging issue to an obstetrician. Early identification and aggressive management helps in reducing maternal and foetal morbidity and mortality due to liver diseases in pregnancy. An insight into aetiology of liver diseases is needed for better understanding, to combat its serious effects and reduce the impact of it.

**Materials and Methods:** This is an observational analytical study conducted at our hospital and data is collected from labour room admissions of department of obstetrics and gynaecology during March 2020 to May 2021.

**Results:** Out of 3737 cases admitted to labour room over a period of 15 months, 3638 cases (97.4%) were discharged healthy and 99 deaths (2.6%) were reported including both COVID and non-COVID cases. Out of 3638 cases, morbidity due to liver diseases was observed in 4.5% cases. Out of 99 deaths reported, 40 patients were COVID negative and 59 were COVID positive patients. Deaths due to liver disease were 12 (12.1%) out of all deaths reported. Out of 59 COVID positive deaths, liver disease was also a factor adding to the risk of mortality in 2 cases.

**Conclusion:** Early diagnosis and aggressive management is cornerstone for decreasing the risk of mortality and morbidity due to liver diseases. A multidisciplinary strategy with close collaboration between intensivists, hepatologists, and obstetricians is required for optimal therapy of liver illness in pregnancy.

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## 1. Introduction

Liver illness in pregnancy can manifest as a pregnancy-specific disorder or as an acute or chronic liver disease that occurs concurrently with pregnancy. Hyperemesis gravidarum, preeclampsia/eclampsia, the syndrome of haemolysis, elevated liver enzymes, and low platelets (HELLP), intrahepatic cholestasis of pregnancy, and acute fatty liver of pregnancy are all hepatic disorders that are peculiar to pregnancy. Viral hepatitis, autoimmune hepatitis, non-alcoholic fatty liver disease, and cirrhosis are examples of acute and chronic primary hepatic diseases

encountered in pregnancy. Acute fatty liver of pregnancy (AFLP), HELLP (Haemolysis, elevated liver enzymes, low platelets) syndrome, and pre-eclamptic liver dysfunction are among the conditions that might have a negative impact on the mother and foetus. Majority of the time, AFLP is misdiagnosed. Pregnancy-related liver disorders are the most common cause of liver dysfunction in pregnant women, affecting up to 3% of them.<sup>1</sup> As there is a need to consider both maternal and foetal health, for the application of diagnostic techniques and pharmacologic therapy for liver disease that develops during pregnancy, there are unique considerations.<sup>2</sup> The COVID-19 pandemic has a significant impact on the body's numerous systems. In addition to the classic COVID-19 respiratory symptoms and signs, digestive symptoms and

\* Corresponding author.

E-mail address: [priyankagowri1310@gmail.com](mailto:priyankagowri1310@gmail.com) (P. V. G. Priyanka).

liver injury have been documented often during the course of the disease.<sup>3</sup> A high-pathogenic human coronavirus infection can cause liver harm directly or indirectly by an immuno-pathological reaction triggered by an excessive inflammatory response.<sup>4</sup> Most of these liver disorders can be identified early and aggressively managed by a multi-specialty team, lowering the risk of maternal death.<sup>5</sup> While immediate pregnancy termination remains the cornerstone of therapy for certain of these life-threatening illnesses, recent advances in our understanding have helped us better manage these individuals generally.<sup>6</sup> In women with chronic liver disease and cirrhosis, the albumin–bilirubin score and the AST to platelet ratio index were predictive of live birth and the progression of pregnancies beyond 37 weeks of pregnancy.<sup>7</sup> Many other scores like MELD score and child pugh score are also used in predicting the severity of liver diseases. A multidisciplinary strategy with close collaboration between intensivists, hepatologists, and obstetricians is required for optimal therapy of liver illness in pregnancy.

## 2. Aim

To study the morbidity and mortality due to liver diseases in pregnancy.

## 3. Objectives

This is an observational analytical study of the aetiology, maternal morbidity and mortality in pregnancies associated with liver disorder.

## 4. Materials and Methods

This study was conducted in Department of Obstetrics and Gynaecology of our hospital which was a designated COVID-19 hospital and tertiary care centre during the COVID-19 pandemic spanning over 15 months from March 2020 to May 2021. All registered, unregistered and referred patients with abnormal liver function tests were analysed to obtain appropriate conclusions. Observational analytical study was conducted after approval from internal ethical committee. All the data was tabulated and the relationship between them was studied. The entire data was represented in the form of percentage tables and graphs.

### 4.1. Place of study

The study was conducted in the department of Obstetrics and Gynaecology at our hospital, Secunderabad, Telangana, a designated COVID-19 tertiary care hospital from March 2020 to May 2021.

### 4.2. Study design

Observational analytical study.

### 4.3. Methodology

Aetiology, complications, maternal morbidity, mortality due to liver disorders in pregnancy were studied.

## 5. Results

Out of 3737 cases admitted to labour room over a period of 15 months (March, 2020 to May, 2021), 3638 cases (97.4%) were discharged healthy and 99 deaths (2.6%) were reported including both covid and non-covid. Out of 3638 cases morbidity due to liver diseases was observed in 4.5% pregnant women. Out of 99 deaths reported in the span of 15 months, 40 patients did not have COVID-19 disease and 59 patients had COVID-19 disease. Deaths due to liver disease was 12(12.1%) out of all deaths reported. Out of 59 COVID positive deaths liver disease was also a factor adding to the risk of mortality in 2 cases.

Out of 12 deaths reported due to liver disease, 6 cases (50%) had HELLP syndrome (haemolysis, elevated liver enzymes and low platelets), disseminated intravascular coagulation (DIC) was seen in 5 cases (41.6%), hepatic encephalopathy was seen in 1 case (8.3%). Acute fatty liver of pregnancy was seen in 3 cases (25%). Hepatorenal failure was seen in one case (8.3%) referred from outside hospital with methotrexate toxicity which was started for medical management of ectopic pregnancy.

**Table 1:** Showing mortality due to liver diseases in pregnancy

Cause	No. of cases	Percentage
DIC	5	41.6%
HELLP	6	50%
Hepatic encephalopathy	1	8.3%
Acute fatty liver of pregnancy	3	25%
Hepatorenal failure	1	8.3%
Liver failure	1	8.3%

**Table 2:** Showing morbidity due to liver diseases in pregnancy

Cause	No. of cases	Percentage
HELLP	18	0.4%
Pre-Eclampsia	130	3.4%
Hyperemesis Gravidarum	17	0.4%
Cholestasis of pregnancy	4	0.1%
Viral Hepatitis	15	0.4%
DIC	8	0.2%
Jaundice	34	0.9%
Sepsis	12	0.3%
Chronic liver disease	2	0.05%
Others	4	0.1%

Out of 3737 cases admitted in labour room, 3638 cases were discharged healthy. In the cases of pregnant women complicated by liver disease, 130 cases (3.4%) had

preeclampsia out of which 18 cases (0.4%) had HELLP syndrome, 17 cases (0.4%) had hyperemesis gravidarum. Intrahepatic cholestasis of pregnancy was found in 4 cases (0.1%), jaundice of unknown aetiology was seen in 34 cases (0.9%) few of which had history of blood transfusions. Sepsis was seen in 12 cases (0.3%) which led to liver disease. Disseminated intravascular coagulation (DIC) was seen in 8 cases (0.2%). 2 cases had chronic liver disease, one of which had liver cirrhosis, and the other had chronic decompensated liver disease with portal hypertension. Vital hepatitis was seen in 15 cases (0.4%) mostly affected by hepatitis A and hepatitis E and 4 of them were known cases of hepatitis B virus. 4 cases (0.1%) of leptospira leading to liver disease and altered liver function was seen.

## 6. Discussion

Pregnancy causes many physiological changes that influence all body organs including the liver.<sup>8</sup> These changes are due to an increase in oestrogen and progesterone levels during pregnancy and also due to hemodilution.<sup>9</sup> Hyperemesis gravidarum, pre-eclampsia or eclampsia, syndrome of haemolysis, elevated liver enzymes, and low platelets (HELLP), intra hepatic cholestasis of pregnancy, and acute fatty liver of pregnancy are all examples of liver problems in pregnancy. There are other acute and chronic liver problems that can happen by chance during pregnancy, such as viral or auto immune hepatitis, drug-induced liver failure, non-alcoholic fatty liver of pregnancy, or liver cirrhosis. The aetiology of morbidity and mortality owing to liver illnesses in Gandhi Hospital, Secunderabad, Telangana, is the subject of this observational analytical study. Pregnancy-related liver disorders afflicted up to 4.5 percent of pregnant women in our study. Pregnancy-related liver disorders afflicted up to 3% of pregnant women, according to research by Westbrook et al.

Out of 3737 cases admitted to the labour room, 3638 were healthy and discharged. Pre-eclampsia was found in 130 instances (3.4 percent) of pregnant women with liver illness, and HELLP syndrome was found in 18 cases (0.4 percent).<sup>12</sup> 12 deaths were linked to liver illness out of 99 deaths reported in our institution over a 15-month period. In two of the 59 covid positive deaths, liver illness was a condition that increased the chance of death.

The covid pandemic had a major impact on the body's many systems. During the course of the disease, digestive symptoms and liver injury have been reported often in addition to the usual COVID-19 respiratory symptoms and signs. An immuno-pathological reaction produced by an overactive inflammatory response can cause liver damage directly or indirectly in a high-pathogenic human coronavirus infection. Up to 60% of SARS covid patients exhibited impaired liver function, according to research by Chau TN et al.<sup>10</sup> In a study conducted by Changedhe et

al, the maternal and perinatal death rates in pregnancies complicated by liver problems were 40 and 37 percent, respectively.<sup>11</sup>

Preeclampsia is a condition that occurs only during pregnancy. Hypertension and proteinuria are two signs that might lead to prenatal growth retardation. With a maternal mortality rate of 1% in severe preeclampsia, up to 5% in HELLP syndrome, and up to 30% foetal death rate, preeclampsia and HELLP syndrome remain a substantial cause of morbidity and mortality for both pregnant women and their foetuses.<sup>12</sup> It is consistent with the findings of our study, which found that HELLP syndrome was responsible for 6% of maternal mortality.

ICP (intrahepatic cholestasis of pregnancy) is a reversible cholestasis that commonly occurs during the third trimester. Pruritus, elevated serum bile acids, and abnormal liver function tests normally disappear after delivery.

Acute fatty liver of pregnancy (AFLP) is a rare but dangerous illness that occurs during the third trimester of pregnancy. AFLP can cause substantial morbidity and mortality in both the mother and the foetus.<sup>13</sup> Errors in foetal mitochondrial fatty acid oxidation, specifically foetal defects in LCHAD, a component of the mitochondrial trifunctional protein (MTP) complex, have been associated to the development of maternal AFLP.

During pregnancy, the ACIP (advisory committee on immunisation practices) recommends immunisation with inactive Hepatitis A and Hepatitis B vaccines. Despite the fact that giving HBIG to pregnant women who are infected with Hepatitis B virus can reduce intrauterine infection rates, it is not widely used due to potential complications and the high cost of treatment.<sup>14</sup>

In women who report with liver dysfunction during pregnancy, a quick differential diagnosis between pregnancy-related and non-pregnancy-related liver illness is necessary.<sup>15</sup> The article gives a summary of liver illness in pregnancy, an update on COVID 19 and its effects on the liver, as well as the morbidity and mortality associated with liver disease in pregnancy. This research could be used as a starting point for future studies looking at trends in the prevalence and treatment of various liver disorders and also its relation to COVID-19 infection.

## 7. Conclusion

Liver disorders in pregnancy have always been a challenging issue for obstetricians. Although it is only the tip of the iceberg we are seeing, most of these liver disorders can be identified early and aggressively managed by a multi-specialty team, lowering the risk of maternal death. While immediate pregnancy termination remains the cornerstone of therapy for certain of these life-threatening illnesses, recent advances in our understanding have helped us better manage these individuals. A multidisciplinary strategy with close collaboration between intensivists, hepatologists, and

obstetricians is required for optimal therapy of liver illness in pregnancy. And the effect of COVID-19 virus on liver during pregnancy is a topic which still needs more research to come to an understanding.

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None.

## 9. Conflict of Interest


None.

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## Author biography

**Pentakota Venkata Gowri Priyanka**, Post Graduate Resident  
 <https://orcid.org/0000-0003-0208-8774>

**Janaki Vellanki**, Professor  <https://orcid.org/0000-0002-0192-5967>

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