

# An update of the incidence of fulminant hepatitis due to viral agents during pregnancy

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**Abstract:** Fulminant hepatitis in pregnant women is one of the major public health issues and remains a challenging clinical problem with extremely high maternal and fetal morbidity and mortality, which, in parallel, viral factors are the most common cause of hepatic disorders and dysfunction during pregnancy that may lead to fulminant hepatic with a fast progression. Therefore, this review helps to inform clinicians about the current status of the incidence of fulminant hepatitis due to viral agents during pregnancy.

**Keywords:** fulminant hepatic, pregnant women, viral, liver

## Introduction

Fulminant hepatitis (FH) refers to the progress of hepatic encephalopathy and defines to a type of severe clinical type of hepatitis distinguished by acute onset, rapid progression, complicated appearances, and worse predictions. According to the studies conducted on viruses with disparate geographic distributions, the most popular causes of viral hepatitis are major public health problem in FH. In addition, a number of viral agents, such as hepatitis A, B, C, D, and E viruses, transfusion transmitted virus, herpes simplex virus, cytomegalo virus, and Epstein–Barr virus, can lead to FH, liver dysfunction, and jaundice in pregnancy universal, as well as the clinical features, have implicated a variant of hepatitis B virus (HBV) that is the most common cause (about 85%) and lead to cirrhosis and hepatocellular cancer. The basic pathologic modifications are massive necrosis, hepatic inflammation, and the degeneration and destruction of hepatocytes and aggregation of macrophages with varying degrees among different types of hepatitis, such as FH failure (FHF) and acute and chronic hepatitis [1–8].

With regard to the reports published on different studies, the incidence of FH is higher in pregnant women in India, Iran, Africa, and the Middle East. On the

contrary, studies carried out in Egypt, Europe, and the USA indicate no difference in severity of FH, especially viral infection in non-pregnant and pregnant women [9–18]. In addition, outbreak of FH among the greater number of patients is more common in patients with viral hepatitis, but for hepatitis A and B is rare [19]. In parallel, China is a region that raises a high level of HBV infection and in the national epidemiological surveys, between 1992 and 1995, 9.57% of the Chinese have positive antigen levels for hepatitis B [20] as well as for complications in hepatitis E virus (HEV) infection; pregnant women are at high hazard, with an increased risk of development of pregnancy; it often leads to a FHF and death at the number of FH cases of HEV infection that is very severe during pregnancy, particularly the second and third trimester pregnancies, may lead to FHF and death in 30%–100% of patients [21, 22]. In addition, in a study in Bangladesh, 58% of deaths have occurred in pregnant women; FH was accompanied by HEV in hospitals [23].

## Reports of Incidence in Different Regions

A prospective observational study with more than a period of 3 years on 55 HEV-infected pregnant women

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by Prasad et al. [24] reported that 92% of the women with symptoms of viral hepatitis had been first presented in the third trimester and they also showed that 77% of women observed in preterm labor and 11% of them observed in premature rupture of membranes in obstetric complications; finally, this study documented the maternal mortality about 5%.

A prospective study by Beniwal et al. [25] during 2 years that was performed on 97 pregnant patients in the third trimester with FHF revealed that 45.7% of patients presented with FHF and also 24.7% (24/97) of patients had expired reporting all of them had FHF.

An observational study by Brohi et al. [7] during a period of 1 year on 52 patients with FHF in pregnancy indicated that 29% of patients include maternal mortality as well as this research demonstrated the frequency of hepatitis B associated FHF about 17.3% and hepatitis C associated FHF about 13.5%. In contrast, Beniwal et al. [25] suggested the similar findings and did not show HCV-associated FHF. Furthermore, in another study by Jaiswal et al. [26] found HBV infection associated with FHF in 19% cases.

Aggarwal et al. [27] have reported that 47.4% of pregnant women with viral hepatitis in the third trimester associated with sole to HEV infection in India; moreover, Jaiswal et al. [26], Singh et al. [28], and Khuroo et al. [29] revealed that HEV infection involves for 50%–70% of all patients and the range of 30%–45% is estimated as fatality rate and even it may be over 70% on these patients. In addition, Tosone et al. [30] suggested that the great majority of FHF reported in the literature had been related to HEV mainly. Furthermore, Beniwal et al. [25] suggested that the prevalence of viral hepatitis in pregnant women in third trimester, according to the studies within 40%–57% of patients, is an outbreak of HEV infection. Banait et al. [31] reported that rate and fatality of this infection increases with the gestational age; in parallel, another research by these authors also indicated that the elevated rate of HEV infection has been found in the first, second, and third trimester courses of pregnancy in 4.8%, 33.3%, and 61.9% of patients, respectively; similar to these findings, Abraham [32] revealed that HEV infection is found in pregnancy patients in 33% in second trimester and 67% in third trimester.

In a retrospective study by Tseng et al. [33] on 41 infants (1–12 months) during 20 years presented to the hospital have shown that out of 41 cases, about 21 infants admitted with FH and the hepatitis B has been observed in them; 14.3% (3/21) of the patients with FH.

Yang et al. [34] in a retrospective study, which involves 54 patients (from 20 to 37 years old) enrolled of fulminant viral hepatitis (FVH) in late pregnancy and their gestational ages ranged from 29 to 41 weeks, demonstrated that the scores of 26 of 54 cases of FVH patients who had undergone cesarean section with the end-stage liver disease before and after this section were notably higher.

The separate reports of Khuroo et al. [19] and Li et al. [35] have documented that outbreak rate of FVH in pregnant women was more than 22% with non-A and non-B viral hepatitis and higher of 60% of mortality rate, respectively.

Using the end-stage liver disease scoring system for analysis of 139 patients by Zhou et al. [36] with chronic FHB, they had observed that 58.3% was as an overall fatality rate in 3 months.

Yang et al. [37] in a retrospective study during 14 years on 90 patients of FVH in pregnancy reported that they found 43.3% as the overall fatality rate of the 90 patients contained in the study.

Jilani et al. [9] by study on 100 patients (50 pregnant and 50 non-pregnant women) with FHF and 150 pregnant healthy females without liver disease as controls showed that HEV-infected pregnant FHF patients had a outstandingly fatality rate over 65.8% compared to 23.5% of non-pregnant women or control group.

Nouasria et al. [38] with comparison of FVH (from 15 to 49 years) in 22 Algerian and 77 French pregnant and non-pregnant women found that French pregnant women were remarkably various between the Algerian patients with FVH (45.5% and 24.9%), but not between the French patients (3.9% and 5.8%).

## Conclusion

Therefore, we concluded that for FHF, there is also increased number of obstetric complications on liver dysfunction during pregnancy, which are related to viral hepatitis especially hepatitis E infection in pregnant women with high mortality in Middle east/Asian pregnant women than European and the US patients.

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