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# Fetomaternal Outcome in Pregnant Women with Acute Hepatitis E

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**Abstract:** Hepatitis E is fairly common among pregnant population and puts a threat to mother and fetal wellbeing. Only limited research is available on association of Hepatitis E infection in pregnancy with fetomaternal outcome. The purpose of the current study was to investigate such patients while carefully eliminating bias by controlling confounders. We aimed to determine the fetomaternal outcome in pregnant women with acute hepatitis E. A descriptive case series was conducted to find fetomaternal outcome in pregnant women with acute hepatitis E. The mean maternal age was 30.05±4.49 years and mean gestational age of the patients was 35.73±2.10 months. Most (47%) of the patients were para 3 followed by para 2 (31.8%). 78.8% of the mothers underwent caesarean delivery. Most of the patients had preterm delivery (69.7%). 16 (24.2%) patients died while majority (75.8%) of the patients survived for more than 30 days after delivery. Most of the mothers (50.0%) died during first 10 days of delivery. 28.8% of patients suffered fetal loss while majority (71.2%) of the neonates survived for more than 7 days. Majority (78.9%) of those who expired died in utero while only a smaller percentage (21.1%) expired in neonatal period. Hepatitis E infection in pregnancy is associated with poor fetomaternal outcome. Careful monitoring and early intervention in the form of caesarean delivery can improve the outcome.

**Keywords:** Viral Hepatitis, Hepatitis E, Feto-Maternal Outcome

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## 1. Introduction

Like other forms of viral hepatitis, Hepatitis E also puts a serious threat to human health. Millions of new infections occur each year globally with more than half of the infections occurring in South Asia [1]. Being largely undiagnosed, the actual prevalence of hepatitis E infection is quite higher than the anticipated prevalence of 20.2% [2]. HEV is known to have five genotypes, four of which have been detected in humans. Genotypes 1 and 2 are more virulent, while genotypes 3 and 4 are more attenuated and accountable for subclinical infection [3]. Reasons for the difference in the outcome of HEV in different geographic areas remain unclear [4]. Hepatitis E can have a variable disease course from a mild flu-like illness to a more severe fulminant hepatic failure [5].

It has a predilection to cause severe disease in pregnant females with up to 60% developing fulminant hepatic failure and

a maternal death rate up to 31% [6]. Acute hepatitis in pregnancy, regardless of its subtype, puts the life of mother and fetus in danger [7]. The nutritional, immunological, and genetic factors play a role in the pathophysiology of fulminant HEV in pregnancy [8]. Viral load of HEV during pregnancy becomes significant [9]. Shrestha et al. in 2011 showed that HEV infection in pregnancy was associated with poor fetomaternal outcome and an increased need for operative intervention [10]. Similar associations have also been reported by Mansoor et al. in 2011 and Hamid et al. in 1996 [11, 12]. During an outbreak in Sudan in 2010 to 2011 among pregnant women with HEV infection, there were 14 intrauterine deaths and 9 premature deliveries [13].

The purpose of this study is to study the morbidity and mortality of pregnant women with hepatitis infection.

## 2. Subject and Methods

It's a descriptive case series study conducted at

Department of Obstetrics and Gynecology, Sir Ganga Ram Hospital Lahore for period 6 months i.e. from September 2016 to March 2017. Sample size of 66 cases was calculated by WHO manual with 80% confidence level and 7% margin of error while taking expected rate of preterm delivery to be 67% in pregnant women with Acute Hepatitis E.

Pregnant women included in the study were those with acute hepatitis E (diagnosed by the presence of Hepatitis E IgM antibodies in the sera of pregnant women) with gestational age of 32 weeks or more at presentation (on dating scan). Patients with singleton pregnancy on ultrasound. Patients with no other co-morbid condition known to be associated with adverse maternal and fetal outcome e.g. hypertensive and cardiovascular disorders, maternal diabetes etc. assessed on previous clinical record, history and examination.

Pregnant woman having liver disorders or other types of viral hepatitis evident from previous clinical record or discovered during routine work up. Patients with multiple gestations (on ultrasound). Patients with congenital fetal anomalies (on ultrasound). Informed consent was taken from the patient and data was kept anonymous for privacy the study was approved by institutional review board of the hospital.

66 patients who presented at the Department of Gynecology and Obstetrics, Sir Ganga Ram Hospital, Lahore and who fulfilled the above criteria were counseled and explained the details of the study. Written informed consent and detailed history was taken from each patient. Patients were followed weekly after presentation until 4 weeks after delivery. Mode of delivery was noted. If female would die within hospital stay, during delivery or within 4 weeks after delivery then maternal death was noted. Death of the fetus in utero or with in first 7 days of life was noted. Fetal Outcome was described in terms of pre-term Delivery (if baby delivered before 37 completed weeks of gestation) and fetal Death (death of the fetus in utero or with in first 7 days of life).

All the collected data was entered into SPSS version 23. Numerical variables i-e maternal age, gestational age and parity were presented by mean  $\pm$ SD and range. Categorical variables i-e mode and term of delivery, maternal and fetal death and timing of maternal and fetal death were presented as frequency and percentage.

### 3. Result

The mean age of 30.05 $\pm$ 4.49 years. The mean gestational age of patients at time of presentation was 35.73 $\pm$ 2.10weeks. There were 11 (16.7%) primiparous and 55 (83.7%) were multiparous. Table 1

Out of 66, Caesarean delivery occurred in 52 (78.8%) while 14 (21.2%) delivered through normal vaginal delivery. Preterm delivery occurred in 46 (69.7%) while 20 (30.3%) had full-term delivery. Maternal death occurred in 16 (24.2%) females while fetal death occurred in 19 (28.8%) neonates. In fetal death cases, 15 (22.7%) had IUD while 4 (6.1%) died within 7days of life. Table 2.

**Table 1.** Baseline characteristics of patients.

Age (years)	30.05 $\pm$ 4.94
Gestational Age	35.73 $\pm$ 2.11
Primiparous	11 (16.7%)
Multiparous	55 (83.7%)

**Table 2.** Outcome of pregnancy.

Mode of delivery	
SVD	14 (21.2%)
C-section	52 (78.8%)
Preterm delivery	46 (69.7%)
Term delivery	20 (30.3%)
Maternal Death	16 (24.2%)
Fetal Death	19 (28.8%)
IUD	15 (22.7%)
First 7 days of life	4 (6.1%)

### 4. Discussion

Liver abnormalities and jaundice are rare in pregnant women and are seen in about 0.3-3% of pregnancies. But when they do occur, they may portend serious liver diseases either due to pregnancy-associated acute liver diseases (e.g., preeclampsia associated liver disease, acute fatty liver disease of pregnancy and hemolysis elevated liver enzymes and low platelet syndrome (HELLP)) or an acute onset viral hepatitis (e.g., hepatitis A and hepatitis B). Acute hepatitis A and E are not commonly come across in industrialized countries. Since they are spread mainly via the fecal oral route, it is principally seen in evolving countries where hygiene is poor. Management rests reassuring. Hepatitis E remains to relish a bad reputation as it has long been perceived to have a high occurrence and more spartan path in gravid women in some topographical areas where HEV is prevalent. At the moment, only few studies have investigated that fetal-maternal outcome in pregnant women who suffer acute hepatitis E infection during pregnancy.

66 cases who met the inclusion criteria were enrolled in this study. The mean maternal age was 30.05 $\pm$ 4.49 years and mean Gestational age of the patients was 35.73 $\pm$ 2.10 months. Most (47%) of the patients were para 3 followed by para 2 (31.8%) which may signify the increasing risk of hepatitis e infection with subsequent pregnancies. It was found that HEV infection was associated with Caesarean delivery (78.8%). Simple Vaginal Delivery was possible in only 21.2% cases. Most of the patients had Preterm delivery (69.7%). All of the SVDs were full term while only 6 (11.5%) of the patients with C-Section were full term and Majority (n=46, 88.5%) required intervention (C-Section) before term. 16 (24.2%) patients died while majority (75.8%) of the patients survived for more than 30 days after delivery. When cross tabulated maternal death with mode of delivery, only 2 patients expired among those delivered by SVD. While 14 (26.9%) patients expired among those who underwent caesarean delivery. Most of the mothers (50.0%) died during first 10 days of delivery followed by 37.5% mothers who expired somewhere between 10-20 days of delivery. When analyzed for fetal outcome, it was found that

28.8% of patients suffered fetal loss while majority (71.2%) of the neonates survived for more than 7 days as shown in table 2. Majority (78.9%) of those who expired died in utero while only a smaller percentage (21.1%) expired in neonatal period.

The findings of previous studies investigating hepatitis E in pregnancy has been summarized in table 3. It can be easily appreciated that there is a great variation among findings of

different authors. However, one thing is certain and that is Hepatitis E in pregnancy is associated with poor fetomaternal outcome. The purpose of the current study was therefore to investigate this aspect of Hepatitis E infection while carefully eliminating the bias by controlling the confounders like concomitant other viral hepatitis, liver disease, other systemic disorders (Mansoor11, Kose14, Bassam15).

*Table 3. Summary of Studies regarding Hepatitis E Infection in Pregnancy.*

Year	Author	Population	C-Section	Preterm Delivery	Maternal Death	IUD	Neonatal death
2017	Current	Pakistan	78.8%	69.7%	24.2%	22.7%	6.1%
2013	Yasmeen16	Pakistan	10%	63.33	26.67%	23.33%	16.67%
2011	Shrestha10	India	26%	67%	18%	11.45%	8.86%
2011	*Mansoor11	Pakistan	66%	76.19%	6%	23.80%	23.80%
2013	*Kose14	India	33%	33%	N/A	16%	N/A
2007	*Bassam15	Iraq	17.85%	25%	0	12.5%	12.5%

Although the results of our study agree with the already existing studies yet there are significant differences. We encountered highest number of Cesareans deliveries (78.8% highest among all) but it was beneficial to the patients as evident from fewer neonatal deaths (6.1%, least among all). Similarly we did early intervention evident from higher rate of pre-term deliveries, but again, it was associated with better fetomaternal outcome evident from decreased maternal deaths (24.2% vs. 26.67%), IUD (22.7% vs. 23.33%) and neonatal deaths (6.1% vs. 16.67%).

It can be thus concluded that Hepatitis E infection in pregnancy is associated with serious consequences in the form of increases need for surgical intervention, pre-term delivery and maternal and fetal loss. It can be however advised on the basis of our findings that careful monitoring and early intervention in the form of labor induction/ caesarean delivery in such patients may improve the outcome.

## 5. Conclusion

Acute Hepatitis E infection during pregnancy predicts poor outcome for mother, fetus, neonate. Careful monitoring and early intervention in the form of induction of labour / caesarean delivery can improve the outcome.

## Conflict of Interest

Author has no conflict of interest.

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