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Hepatitis E virus in pregnancy with fetomaternal outcome-A prospective study

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Abstract:
Objective: *This study was carried out to assess the prevalence of hepatitis E infection in pregnant women and their obstetric and fetal outcome.*
Background: *HEV is the major cause of hepatitis in pregnancy. Fulminant hepatic failure and maternal mortality was more commonly associated with HEV infected pregnant women compared to HEV infected non pregnant women.*
Materials and Method: *39 pregnant women admitted at Gynae ward with serologically proven HEV were included in the study. All these patients were followed during their hospital stay with liver function tests and coagulation profile. Maternal morbidity and mortality and fetal outcome were recorded.*
Results: *82%of patients belong to age group of 20-29 years.92%of patients were from rural area. Emergency and Registered patients were 90% and 10% respectively. Majority of patients were primigravidae (41%) and most patients were affected in their third trimester (79.5%).82%of patients had initial serum billirubin level >5%,95%had raised serum ALT level and 60% had altered coagulation profile. Maternal death rate was 57.1% who had initial serum billirubin level>15mg%. Most common maternal complication was hepatic encephalopathy (15.4%) followed by DIC(10.3%), Post partum haemorrhage (5.1%) ,Thrombocytopenia (2.6%) , renal failure (2.6%) death (20.5%). Out of 39 women, 38 delivered and 1 remained undelivered. 82% delivered vaginally and 15% delivered by cesarean section.72%of the patients delivered pre term, 25% at full term and 33.3%intra uterine deaths were there. NICU admission rate was 69% and major cause for admission was Low birth weight (54%) followed by prematurity (40%) and birth asphyxia and others. Perinatal mortality rate is 61.5%.*
Conclusion: *HEV in pregnancy especially in third trimester endangers the maternal and fetal well being. Complications, maternal and perinatal morbidity and mortality are highly associated with HEV infection. So early diagnosis and treatment is required for better management of the patients.*
Key words: *Hepatitis E virus, Pregnancy, Maternal Mortality, Perinatal mortality*

I. Introduction

Hepatitis E virus (HEV) is a single-stranded RNA virus that causes large-scale epidemics and sporadic cases of acute viral hepatitis in developing countries. The HEV is transmitted via the faecal-oral route and is easily spread by water contaminated with human faecal matter[1].In men and non pregnant women, the disease is mainly self-limiting and causes no chronic evolution and has a case-fatality rate of less than <0.1%.[2,3] However in pregnant women particularly from certain geographic areas in India, HEV infection is more severe, often leading to fulminant hepatic failure and death in up to 15% to 20% of cases.[1] The course and the severity of the HEV infection is quite different in developed and the developing countries.[4]Reason for the difference in the outcome of HEV in different geographical areas remain unclear[5] ,but could be the result of early childhood HEV exposures producing long lasting immunity and or modify subsequent responses to exposure to the virus. Alternatively, the predominant HEV genotype(s) in some geographical location could be less virulent than those in others.[6] This study was conducted to know the prevalence, obstetric complications and perinatal outcome in serologically proven HEV positive pregnant women.

II. Materials and Methods

39 pregnant women admitted at the Hospital, either emergency or registered with serologically proven HEV were included in the study. Diagnosis was made on clinical presentation i.e. jaundice, vomiting, loss of appetite, altered sensorium, baseline investigations i.e. complete blood count and liver function tests, prothrombin time, APTT, FDP, d-dimer also carried out. All these patients were followed during their hospital

stay regarding pregnancy status, either continued or termination, any complications, maternal and foetal morbidity and mortality and perinatal outcome was recorded.

III. Results

39 pregnant women (mean age 23.5±2.5yrs) presenting with clinical and biochemical evidence of hepatitis and serologically proven HEV were included in this study. Majority of the patients were from rural area (92%) and 90% of patients were from lower socio economical class.90% of patients were emergency admission and only 10% were previously registered before admission. Most of the pregnant women were primigravida (41%) and majority were in their third trimester(79.5%).

Table1: Age, Gravidity and duration of pregnancy at the time of admission.

Age(Years)	**No. of patients**	**% of patients**
<20	3	7.7
20-24	17	43.6
25-29	15	38.4
≥30	4	10.3
Gravida		
Primigravida	16	41
Second gravida	15	38.5
Multigravida	08	20.5
Duration of pregnancy		
First trimester	0	0
Second trimester	8	20.5
Third trimester	31	79.5

Haemoglobin of these patients was between 6 – 12 g/dl with mean of 9.33 ± 1.5 g/dl. Prothrombin time and aPTT were raised in 60% of patients.FDP and d-dimer were also raised in 60% of patients. Maximum derangement of hematological and biochemical tests was noted in patients who presented during third trimester and postpartum. Results of serum billirubin and Seum ALT shown in table 2.

Table2: Results of investigations**.**

A.Serum Billirubin (mg%)			
Value	No.of patients	Maternal death	%of maternal death
<5	7	0	0
5-9	11	1	9
10-14	14	2	14.3
≥15	7	4	57.1
B.Serum ALT (IU/ml)			
<35	1	0	0
35-499	20	3	15
500-999	16	4	25
≥1000	2	1	50

Table3: Maternal morbidity, mortality and foetal outcome

Maternal morbidity	**Frequency**	**Percentage**
Hepatic Encephalopathy	6	15.4%
DIC	4	10.3%
Thrombocytopenia	1	2.6%
Post partum haemorrhage	2	5.1%
Acute renal failure	1	2.6%
Maternal outcome		
Vaginal Delivery	32	82%
Cesarean section	6	15.4%
Undelivered Expired	01	3%
Preterm Delivery	28	72%
Full term Delivery	10	25%
Recovered	31	80%
Mortality	8	20.5%
Foetal outcome		
Live	26	66.6%
Intra uterine death	13	33.3%
Total perinatal death	24	61.5%
NICU admission required	18	69%
Low birth weight	14	54%

IV. Discussion

Hepatitis E is widely accepted to be self-limiting and not to progress to chronic disease. The foetal and obstetric outcomes of pregnant women with jaundice and acute viral hepatitis E appear to be worse compared to hepatitis due to other causes.[2] In this study 50% of pregnant women were of age group 25 or less. Most of the pregnant women were primigravida (41%) and 79%of patients were in third trimester. These findings are consistent with the study of shrestha et al[7]who had noted that HEV infects mostly young adults,41% were primigravida and 90% of women in third trimester. Majority of the patients were from rural area (92%) and 90% of patients were from lower socio economical class.90% of patients were emergency admission and only 10% were previously registered before admission. This is because most of the patients were from rural areas and from lower socio economical class where probably the importance of antenatal registration and visits is not well established. 57% of maternal deaths were noted in patients who has initial serum billirubin level of ≥15. It shows that maternal mortality is directly related to the serum bilirubin level.[9]

Table4: Comparison of Maternal mortality rate due to HEV in different studies.

Study	Year	Maternal mortality rate (%)
Banait et al	2007	54%
Patra et al	2007	15-20%
Shukla et al	2011	33.3%
Shrestha et al	2011	19.35%
Present study	2009-11	20.5%

Obstetric and fetal outcome in HEV infected pregnant women is not favorable as noticed by other studies also. 16% of women turned in to hepatic encephalopathy and 5 (83%) died.DIC and PPH occurred in 10.3% and 5.1% of cases respectively and 3(50%) death occurred because of both. These findings are similar with the other studies.[1,11,14] 72% of pregnant women with HEV had preterm deliveries, which is consistent with findings of Kumar et al.[10] who observed that two-third of the pregnant women with HEV had preterm deliveries.Out of 39 deliveries,26 live births and 13 intra uterine deaths were noted. NICU admission rate was 69% and major cause for admission was Low birth weight (54%) followed by prematurity (40%) and birth asphyxia and others. Perinatal mortality rate is 61.5%.The reason behind high perinatal mortality is still not clear. It may be due to vertical transmission from mother to baby, preterm deliveries and low birth weight.[1,10] which leads more perinatal deaths as seen in this study too. Banait et al. in Mumbai reported 69% perinatal mortality which is similar to this study's finding.

V. Conclusion

HEV in pregnancy especially in third trimester endangers the maternal and fetal well being. Complications, maternal and perinatal morbidity and mortality are highly associated with HEV infection. So early diagnosis and treatment is required for better management of the patients. Government hospitals like ours, catering mostly to people who are economically downtrodden, and belonged lower socio economical class showed HEV infection maximally than middle and upper class. These patients belongs to the overcrowded area, which reflects the poor sanitation conditions and low standard of lifestyle-all these things contributes to the transmission of infection. So water supply should be of high quality complying with drinking water standards and safe sanitation should be given priority.

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