



## Original article

# Effect of viral hepatitis E on maternal and fetal outcome

Naushaba Rizwan<sup>1</sup>, Syed Farhan Uddin<sup>2</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro, Sindh-76090, Pakistan.

<sup>2</sup>Department of Obstetrics and Gynecology, Liaquat University Hospital, Hyderabad-71000, Pakistan.

### Article history

Received 21 November 2016  
Accepted 30 November 2016  
Early online 30 December 2016  
Print 31 January 2017

### Corresponding author

**Naushaba Rizwan**  
Assistant Professor,  
Department of Obstetrics and  
Gynecology,  
Liaquat University of Medical and  
Health Sciences (LUMHS),  
Jamshoro, Sindh-76090, Pakistan.  
Phone: +92-22-3401558  
Email: naushabarizwan-  
syed@yahoo.com

### Abstract

Viral hepatitis in pregnancy has been a subject of continuing interest. It is a major cause of enteric transmission of non A and non B hepatitis and is usually self limiting. However in pregnant women, it is more severe. This prospective study was conducted in the department of obstetrics and gynecology, Liaquat University of Medical and Health Sciences, Jamshoro from May 2013 to July 2014 to know the frequency and outcome of women with hepatitis E virus (HEV) infection. Among the women with jaundice, sixty eight pregnant women were selected as cases and 16 non pregnant women were selected as control and a comparative study was done. Blood sample were taken at the beginning of the pregnancy and in the postpartum period. Serology was done for HEV and other tests included blood picture, hepatic and kidney function tests. All women underwent ultrasound examination. Hepatitis E was found in 77.9% of pregnant women and 25% in non pregnant women. The commonest age group was between 21-25 years. The liver function test and renal function test were not significantly different in the two groups. No virus was detected in 9 (13.2%) cases and 8 (15%) control. The maternal mortality was 19.1% in cases. The fetal loss was found in 42.6% of cases. Pregnancy with hepatitis E is associated with adverse maternal and fetal outcome.

**Key words:** Fetal outcome, HEV, Maternal outcome

**DOI:** 10.5455/jmas.249914

© 2017 Deccan College of Medical Sciences. All rights reserved.

Infection with hepatitis E virus during pregnancy is associated with increased morbidity and mortality. It is a major cause of enteric transmission of non A and non B hepatitis in many developing countries with large epidemics reported in Asia, Africa and Latin America<sup>1,2</sup>. It is usually self limiting. However in pregnant women, it is more severe. The high mortality rate in pregnancy has been thought to be secondary to the associated hormonal changes during pregnancy and consequent immunological changes<sup>3</sup>. The incidence of

hepatic failure and mortality is higher than with other viral infections<sup>4</sup>. There is variation in the course outcome of viral hepatitis in pregnancy<sup>5-7</sup>. The purpose of this study was to know the frequency and outcome of women with hepatitis E virus (HEV) infection.

### Material and methods

This prospective study was conducted in the department of obstetrics and gynecology, Liaquat University of Medical and Health Sciences, Jams-

horo from May 2013 to July 2014. Among the women with jaundice, sixty eight pregnant women were selected as cases and 16 non pregnant women were selected as control and a comparative study was done. The protocol was approved by the Ethical Committee and written consent was taken from all the women. Blood sample were taken at the beginning of the pregnancy and in the postpartum period. Serology was done for HEV and other tests included blood picture, hepatic and kidney function tests. All women underwent ultrasound examination. All data collected was analyzed using SPSS version 17.0. Student t-test and chi-square tests were applied.

### Results

During the study period 68 pregnant women were selected as cases and 16 non pregnant women were chosen as controls. The commonest age group of women having jaundice was between 21-25 years. Hepatitis E was found in 77.9% of pregnant women and 25% in non pregnant women (Table 1). No virus was detected in 9 (13.2%) cases and 8 (50%) control.

The liver function test and renal function test were not significantly different in the two groups (Table 2). The maternal mortality was 19.1% (n=13) in cases. The fetal loss was found in 42.6% (n=29) of cases.

### Discussion

Hepatitis E virus causes epidemics of acute viral hepatitis particularly in developing countries. There is an increased rate of maternal mortality in

pregnant women with hepatitis E. Mortality rates have ranged between 5% and 25%, much higher than man and non pregnant women<sup>1</sup>. Hepatitis E infection during third trimester, especially with genotype 1 is associated with more severe infection and might lead to fulminant hepatic failure and maternal death<sup>4,8,9</sup>. Third trimester maternal mortality in HEV is upto 15% to 25% of cases<sup>10</sup>.

The prevalence of hepatitis E was 77.9% in our study. It was similar to the study conducted by Khuroo et al<sup>11</sup> in which it was 86% while varying rate of HEV infection from 32% to 86% have been reported in different studies<sup>3</sup>.

The reason for the difference in the outcome of HEV infection in different geographical areas remain unclear but could be the result of early childhood HEV exposure producing long lasting immunity or modifying subsequent responses to exposure to the virus<sup>3</sup>.

There is a complex interaction among viral, host, immunological and hormonal factors producing severe liver damage in pregnancy<sup>12</sup>.

In our study, maternal deaths were noted in 19.1% of cases. It was comparable to other studies done on Asian population. A study conducted in North India reported 12% to 64% mortality rate<sup>1</sup>. A high infection rate but very low mortality rate of 3.4% was reported in another study carried out in South India<sup>3</sup>.

All women who presented with hepatic encephalopathy died. This finding was similar to the study conducted by Banait et al<sup>13</sup>.

**Table 1:** Comparison of type of hepatitis in controls and cases

Type of viral hepatitis	Cases (n=68)	Controls (n=16)	P value
HBV positive	5 (7.4%)	3 (18.8%)	0.173
HCV positive	1 (1.5%)	1 (6.3%)	0.347
HEV positive	53 (77.9%)	4 (25.0%)	<0.001**
No virus detected	09 (13.23%)	08 (50%)	0.003*

\*Statistically significant; \*\*Statistically highly significant

**Table 2:** Blood parameters (Mean±2SD)

Blood parameter	Cases (n=68)	Controls (n=16)	P value
Hemoglobin (gm/dL)	7.87±2.36	8.13±2.28	0.698
Serum bilirubin (mg/dL)	8.52±6.11	6.38±4.39	0.191
Prothrombin time (PT) (sec)	26.19±23.02	27.69±26.20	0.832
International normalized ratio (INR)	3.03±4.95	2.31±2.30	0.614
Serum creatinine (mg/dL)	1.45±2.16	1.24±1.45	0.838

There is a very high risk of vertical transmission of HEV infection from mother to fetus<sup>5</sup>. It might be responsible for 2400 to 3000 still births each year in developing countries<sup>4</sup>. In our study a high fetal wastage was found in 42.6% of cases. Same observation was noted in other study<sup>13</sup> in which fetal mortality was found to be 69% in cases. In live births, hepatitis E was found in two babies. Most of neonates were lost to follow up. The exact rate of vertical transmission could not be estimated as most of the surviving neonates were lost to follow up.

Breast feeding is considered safe in asymptomatic women infected with HEV. It is unsafe if the mother has acute hepatic disease or an increased viral load<sup>14,15</sup>.

### Conclusion

Pregnancy with hepatitis E is associated with adverse maternal and fetal outcome. HEV infection can be prevented by practicing good hygiene, handling food appropriately and drinking safe water.

**Acknowledgments:** None

**Conflict of interest:** None to declare

### References

1. Khuroo MS, Teli MR, Skidmore S, Sofi MA, Khuroo MI. Incidence and severity of viral hepatitis in pregnancy. *Am J Med.* 1981 Feb; 70(2):252-5.
2. Nayak NC, Panda SK, Datta R, Zuckerman AJ, Guha DK, Madanagopalan N, Buckshee K. Aetiology and outcome of acute viral hepatitis in pregnancy. *J Gastroenterol Hepatol.* 1989 Jul-Aug; 4(4):345-52.
3. Navaneethan U, Al Mohajer M, Shata MT. Hepatitis E and pregnancy: understanding the pathogenesis. *Liver Int.* 2008 Nov; 28(9):1190-9.
4. Patra S, Kumar A, Trivedi SS, Puri M, Sarin SK. Maternal and fetal outcomes in pregnant women with acute hepatitis E virus infection. *Ann Intern Med.* 2007 Jul 3; 147(1):28-33.
5. Singh S, Mohanty A, Joshi YK, Deka D, Mohanty S, Panda SK. Mother-to-child transmission of hepatitis E virus infection. *Indian J Pediatr.* 2003 Jan; 70(1):37-9.
6. Beniwal M, Kumar A, Kar P, Jilani N, Sharma JB. Prevalence and severity of acute viral hepatitis and fulminant hepatitis during pregnancy: a prospective study from north India. *Indian J Med Microbiol.* 2003 Jul-Sep; 21(3):184-5.
7. Jaiswal SP, Jain AK, Naik G, Soni N, Chitnis DS. Viral hepatitis during pregnancy. *Int J Gynaecol Obstet.* 2001 Feb; 72(2):103-8.
8. Teo CG. Fatal outbreaks of jaundice in pregnancy and the epidemic history of hepatitis E. *Epidemiol Infect.* 2012 May; 140(5):767-87.
9. Devi SG, Kumar A, Kar P, Husain SA, Sharma S. Association of pregnancy outcome with cytokine gene polymorphisms in HEV infection during pregnancy. *J Med Virol.* 2014 Aug; 86(8):1366-76.
10. Ranger-Rogez S, Alain S, Denis F. Hepatitis viruses: mother to child transmission. *Pathol Biol (Paris).* 2002 Nov; 50(9):568-75. [Article in French]
11. Khuroo MS, Kamili S. Aetiology, clinical course and outcome of sporadic acute viral hepatitis in pregnancy. *J Viral Hepat.* 2003 Jan; 10(1):61-9.
12. Velosa M, Figueiredo A, Gloria H, Morbey A, Mateus E, Neves Z, Araujo A, Carvalho A, Oliveira J, Barroso E. Fulminant hepatitis E in a pregnant women. *GE Jornal Português de Gastreenterologia.* 2013 Sep-Oct; 20(5):210-214.
13. Banait VS, Sandur V, Parikh F, Murugesh M, Ranka P, Ramesh VS, Sasidharan M, Sattar A, Kamat S, Dalal A, Bhatia SJ. Outcome of acute liver failure due to acute hepatitis E in pregnant women. *Indian J Gastroenterol.* 2007 Jan-Feb; 26(1):6-10.
14. Kumar RM, Uduman S, Rana S, Kochiyil JK, Usmani A, Thomas L. Sero-prevalence and mother-to-infant transmission of hepatitis E virus among pregnant women in the United Arab Emirates. *Eur J Obstet Gynecol Reprod Biol* 2001 Dec 10; 100(1):9-15.
15. Chibber RM, Usmani MA, Al-Sibai MH. Should HEV infected mothers breast feed? *Arch Gynecol Obstet* 2004 Jul; 270(1):15-20.