Seroepidemiological Profile and Clinical Pattern of Acute Viral Hepatitis E in Pregnant Women during Water Borne Epidemic at Ichalkaranji, Maharashtra

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Research Article

Abstract: **Objectives:** Hepatitis E (HEV) is one of the important causes of jaundice in pregnancy. It has caused large scale epidemics and sporadic cases. The present study was aimed to identify seroepidemiological and clinical pattern along with outcome of Hepatitis E infection especially in pregnant women. **Methodology:** This study was conducted in a tertiary care hospital at Dr. D. Y. Patil Hospital, Kadamwadi, Kolhapur, Maharashtra, India. There was a large water borne epidemic outbreak of acute HEV infection at Ichalkaranji, a small town near Kolhapur, between May to July 2012. Out of the 123 pregnant women who were positive for HEV infection, 37 women were admitted to our hospital. Pregnant women who were not willing to participate in the study were excluded from the study. **Results:** Of the 37 pregnant women, 51.35% were aged between 21 to 25 years and the mean age was 23.73 ± 3.59 years. Majority of the women presented with HEV during the third trimester (75.68%) and 59.46% patient presented with multi-parity. The most common presentation included yellowish discolouration of sclera and itching all over the body (100% each) and the commonest signs at presentation was scleral icterus (100%). Maternal mortality was noted in one case (2.7%) and fetal mortality in four cases (13.51%). **Conclusion:** HEV infection in pregnancy poses high risk of maternal and fetal morbidity and mortality.The interdisciplinary approach, specialized care, high-risk support and close monitoring of patients are the pre requisites for successful management of HEV in pregnancy.

Keywords: Hepatitis E virus; Jaundice; Maternal mortality; Pregnancy.

Introduction

The jaundice caused because of Hepatitis E in pregnant woman which is an RNA type of virus.[1] This virus is known to cause large scale epidemics and sporadic cases of acute viral hepatitis in developing countries.[2] Incidence of hepatitis varies greatly around the world. In developed countries the incidence is around 0.1% and there is no difference in the course of the disease in pregnant and non-pregnant women in developing countries incidence ranges from 3-20% or higher and there is a higher incidence of maternal mortality with fulminant hepatitis.[3],[4] The prevalence and etiology of HEV still remains debatable. The exact prevalence of acute viral hepatitis and fulminant hepatic failure due to HEV in pregnancy is still a matter of conflict.[5] It is primarily transmitted through fecal-oral exposure, often through contaminated water supplies. Person-to-person transmission is uncommon and vertical transmission does occur.[6] It has the propensity to cause severe disease in pregnancy.[7] In pregnant patients, the worsening of hepatitis in pregnancy has been reported mostly in developing countries like North Africa, India, Pakistan, Ghana and Egypt.[8] Clinical presentation can range from asymptomatic infection to fulminant hepatitis with hepatic encephalopathy that can be confused with acute fatty liver of pregnancy. Its specific diagnosis depends on the detection of specific sero-logical markers which are IgM HEV and IgG HEV for acute and chronic hepatitis status respectively. Considering the high rate of adverse maternal and fetal outcomes and scarcity of the literature the present study was undertaken to identify the seroepidemiological, clinical pattern and outcome of Hepatitis E infection in pregnant women**.**

Methodology

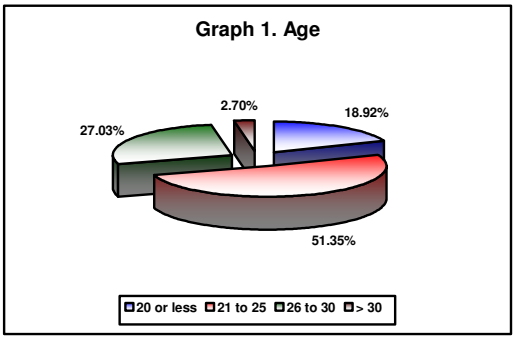
This study was conducted in a tertiary care hospital at Dr. D. Y. Patil Hospital, Kadamwadi, Kolhpaur. Out of the 123 pregnant women who were positive for HEV infection, 37 women were transferred to our hospital for further management. Pregnant women who were not willing to participate in the study were excluded from the study. Prior to the commencement the ethical clearance was obtained from Institutional Ethics Committee, Dr. D. Y. Patil Medical College, Kolhpaur, Maharashtra, India. The selected patients were briefed about the nature of the study. Further these women were interviewed for demographic data such as age, geographical location, socioeconomic status, sanitary and sewage disposal conditions, source of water supply, water purification methods and obstetric history. A thorough clinical examination was conducted and the findings were recorded on a predesigned proforma. These patients were investigated for complete blood count (CBC), random blood sugar, complete urine examination, blood group and Rh factor,

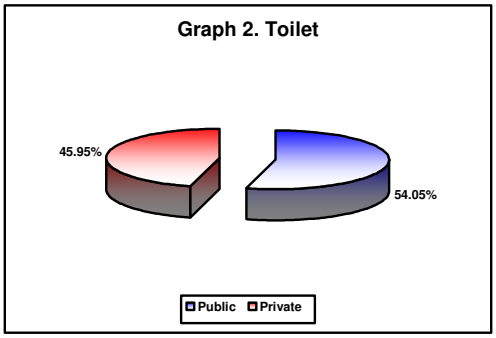
Abdominal/Pelvic ultrasonography and Viral serology for Hepatitis A, B, C and E done. Ultrasonography was done to assess the fetal well being, gestational age, amount of liquor, placental localization and any associated fetal anomalies & for liver pathology like fatty liver, cholestasis etc. Liver function tests including serum bilirubin (Total & both direct & indirect), alkaline phosphatase (ALT), serum transaminases (SGOT, SGPT) were also done. Serum fibrinogen levels, prothrombin time (PT), activated prothrombin time (APTT) were measured in anticipation of bleeding episodes. Patients were hospitalized and were observed regarding worsening of symptoms. Data obtained was coded and entered into excel worksheet. The categorical data was expressed as rates, ratios and percentages whereas continuous data was expressed as mean ± standard deviation (SD).

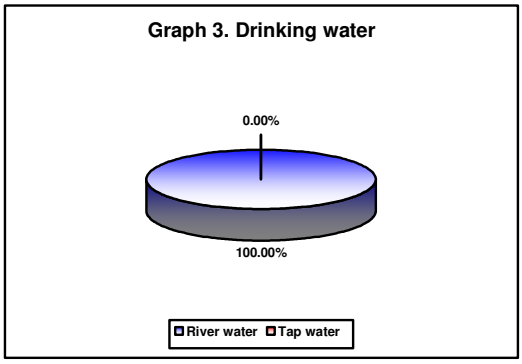
Results

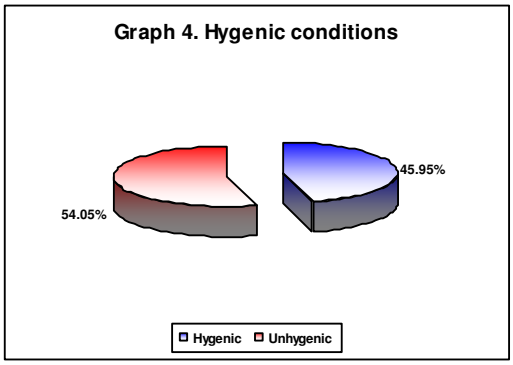
Table 1: Demographic characteristics and obstetric history

Variables		Distribution (n=37)	
		Number	**Percentage**
Age (Years)	20 or less	7	18.92
	21 to 25	19	51.35
	26 to 30	10	27.03
	> 30	1	2.70
	Total	**37**	**100.00**
Toilet	Public	20	54.05
	Private	17	45.95
	Total	**37**	**100.00**
Drinking	River water	37	100.00
Water	Tap water	0	0.00
	Total	**37**	**100.00**
Hygenic	Hygenic	17	45.95
Conditions	Unhygenic	20	54.05
	Total	**37**	**100.00**





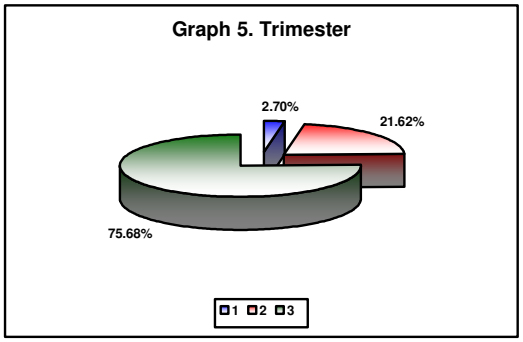


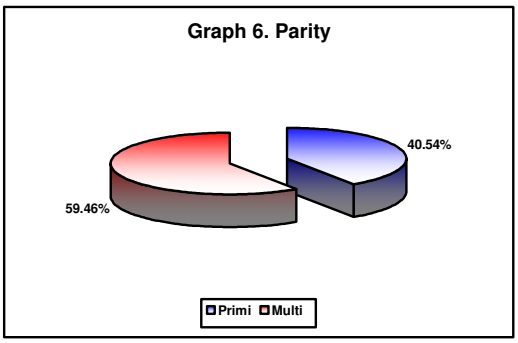


The demographic characteristics of the study population are as shown table 1. More than half (51.35%) of the pregnant women were aged between 21 to 25 years. The mean age of the study population was 23.73 ± 3.59 years. Of the 37 women 54.05% used public toilet facilities. The source of drinking water was river water among all the pregnant women (100%) Less than half (45.95%) had followed hygienic living.

Table 2: Obstetric history

Variables		Distribution (n=37)	
		Number	**Percentage**
Trimester	1	1	2.70
	2	8	21.62
	3	28	75.68
	Total	**37**	**100.00**
Parity	Primi	15	40.54
	Multi	22	59.46
	Total	**37**	**100.00**

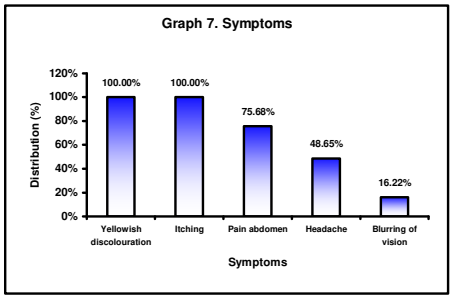




Majority of the women presented with HEV during the third trimester (75.68%). Almost one third (59.46%) presented with multi-parity (Table 2). The mean duration of symptoms was 5.46 ± 1.35 days. The most common presentation included yellowish discolouration of sclera and scleral itching (100% each). The most common signs at presentation was the icterus (100%). The other signs and symptoms are as shown in Table 3. The clinical examination findings and investigations are as shown in Table 4. Of the 37 admissions, maternal mortality was noted in one case (2.7%) and fetal mortality in four cases (13.51%).

Table 3: Presentation

Variables		Distribution (n=37)	
		Number	**Percentage**
Symptoms	Yellowish discolouration	37	100.00
(Multiple	Itching	37	100.00
Responses)	Pain in abdomen	28	75.68
	Headache	18	48.65
	Blurred vision	6	16.22
Signs *(Multiple*	Pallor	9	24.32
Responses)	Icterus	37	100.00



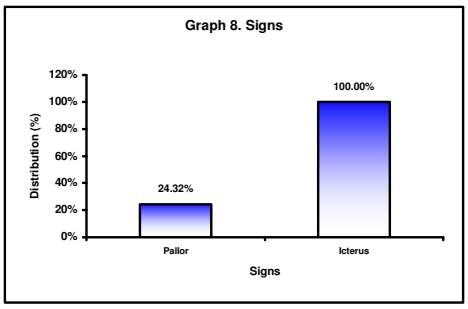
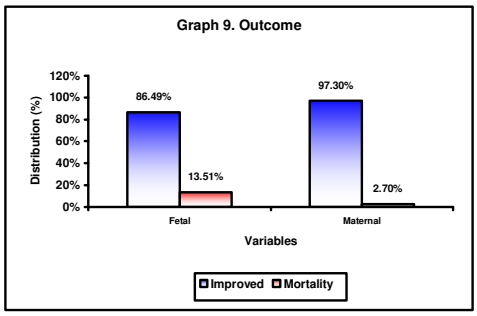


Table 4: Clinical examination findings and investigations

Variables		Distribution (n=37)	
		Mean	**SD**
Blood pressure	Systolic	117.57	9.29
(mm Hg)	Diastolic	71.57	7.96
Pulse Rate	*(bpm)*	82.57	13.51
Investigations	Hb (gm%)	10.67	1.49
	Total bili (mg%)	8.97	5.22
	Direct bili (mg%)	4.66	2.93
	SGOT (IU/L)	1204.40	1277.81
	SGPT (IU/L)	959.37	1439.24

Table 5: Outcome

Variables		Distribution (n=37)	
		Number	**Percentage**
Fetal	Improved	32	86.49
	Mortality	5	13.51
	Total	**37**	**100.00**
Maternal	Improved	36	97.30
	Mortality	1	2.70
	Total	**37**	**100.00**



Discussion

Hepatitis E is particularly a threat for pregnant women. Occurrence of life threatening fulminant hepatic disease in pregnant women ranges from 15–25%.[9] Hepatitis E is the only hepatitis that apparently has this virulent impact on pregnant women. Miscarriages or premature delivery can also occur as a result of HEV infection.[10] Hepatitis E has a higher incidence and mortality rate in pregnancy than in the nonpregnant women who are not infected with HEV Infection. It is rare in the United States but endemic in developing countries, including areas of Asia, Africa, and Central America.[9] Hepatitis E damages the liver sinusoidal cells which decreases the ability of these cells to protect hepatocytes against endotoxins. Hepatocytes can be injured directly by endotoxins or indirectly by eicosanoids that cause platelet aggregation, inflammation and other effects. Release of prostaglandins can lead to chemotactic attraction of inflammatory neutrophils. This can result into swelling of the tissue by oedema and arrest of the bile flow. The enhanced sensitivity of pregnant women to such an endotoxin mediated effect is well recognized and might explain the strikingly high mortality of Hepatitis e in pregnancy.[18] New insights into the pathophysiology of the ineraction of Hepatitis E and pregnancy suggest the involvement of immunology and host susceptibility factors. Their interacton plays definitive role in disease process. HEV infection during pregnancy is associated with a shift in the Th1 /Th2 balance towards Th2 response.[19] Infection of the foetus with HEV may be responsible for the increased severity of the disease in the mother.[20] In the present study, most of the (51.35%) pregnant women were aged between 21 to 25 years. The mean age of the study population was 23.73 ± 3.59 years. Similar findings were reported in a study from Ludhiana[11] and New Delhi.[5]. The younger age of the study population in the present study and other studies could be attributed to the socio-cultural practices of the early marriages in India. Of the 37 women in our study, 54.05% used public toilet facilities. The source of drinking water was river water among all the pregnant women (100%). Less than half (45.95%) had followed hygienic living. However these findings could not be compared with the other studies due to the scarcity of the data. Majority of the women presented with HEV during the third trimester (75.68%). Kumar et al,[13] and a study from New Delhi[5] also reported highest prevalence of HEV among the pregnant women during third trimester. A study from New Delhi[5] also reported median gestational age of 29.38±3.9 weeks. Our findings are also similar to the observations seen in other studies by Jaiswal et al[14]. However the present study did not consider the gestational age. Almost one third (59.46%) presented with multi-parity. The mean duration of symptoms was 5.46 ± 1.35 days. Our findings are consistent with Mexican and African studies done by Luis J et al[15] (11.6% primigravidae) and Elsheikh et al[16] (17.5% primigravidae) respectively as maximum pregnant women presented during the second gravida. Whereas, a study done in Lahore[7] reported majority of patients were having parity 1 to 3 i. e 75% again showing that younger age groups are affected more. The parity status of the pregnant women in the present study was quite different compared to other studies which could be probably due to the bias in patient's characteristics as the present study only enrolled the cases from the large water borne epidemic outbreak of acute HEV infection. The most common presentation included yellowish discolouration of sclera and scleral itching (100% each). The most common sign at presentation was icterus (100%). Similar findings were reported in a study from New Delhi[5] where all the patients (100%) presented with complaints of yellowish discoloration of sclera and urine. Loss of appetite was described by 62% and fever

by 43% of patients. Of the 37 admissions, maternal mortality was noted in one case (2.7%) and fetal mortality in four cases (13.51%).Another study from Lahore[7] maternal morbidity and mortality was observed and 10/33 patients developed worsening of symptoms. Out of these 10, 6 patients had DIC and 2 patients had PPH and 2 patients fulminant hepatic failure and expired (6% maternal mortality). A study from Ludhiana[11] reported maternal mortality of 12%. HEV causes a more severe disease than hepatitis A virus, with mortality rates of 1-2% during epidemics,[17] and of 20-30% in pregnant women. However in the present study the maternal and fetal mortality was limited compared to the other studies from India and other parts which could be due to intensive interdisciplinary care of the patients and smaller sample size. Hepatitis E is best prevented by providing clean drinking water and following strict sewage disposal. Postexposure or pre-exposure anti-HEV immunoglobulins have demonstrated no benefit, and one study demonstrated a decreased rate of total HEV infections but no change in the number of clinical cases when administered to pregnant patients during an outbreak. Although anti-HEV antibodies and HEV RNA have been found in colostrum of mothers, according to the ACOG, breastfeeding is not contraindicated. Overall the present study showed that, consequent interdisciplinary approach, to include specialized care, high-risk support, and close monitoring of patients, are prerequisite for successful management of HEV in pregnancy.

Conclusion

Currently no treatment exists for hepatitis E. The only treatment available addresses the symptoms and not the disease. No antiviral therapy has been proven effective against the virus. The only cure is prevention. HEV infection prevention and control strategies typically involve improvement of hygiene conditions & provision of safe, pure drinking water. There is also need of segregation of waste water and raw sewage from drinking water sources. As evidence of person to person transmission of HEV is increasing, it is prudent that strategies focused at reducing transmission by this route – such as hand washing with soap are implemented in an effort to reduce transmission. Since the success of current interventions is limited, the need to develop a reliable Hepatitis E vaccine is imperative so that innocent young lives will be saved. Trials of Hepatitis E vaccine are underway in many countries including one large efficacy trial in China.

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