

*Research Article***Hepatitis E virus infection in patients with acute on top of chronic liver diseases****Magdy Fouad***, **Reem Y. El Sheemy***, **Shereen S. Gaber**** and **Randa Sh. Ali***

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Abstract

Introduction: Acute on chronic liver failure (ACLF) characterized mainly by acute deterioration of underlying chronic liver disease. Hepatitis E virus (HEV) was reported as a precipitating event. **Aim of the study:** The aim of this study was to detect HEV infection in patients with acute on chronic liver failure. **Materials & Methods:** This is across sectional study conducted in Tropical department Minia university hospital in the period from December 2018 to December 2019. It included 30 patients with acute on chronic liver disorders, where blood samples were collected and HEV tested for anti-IgM and IgG by ELISA and then for HEV RNA by RT-PCR. **Results:** HEV RNA was detected in 13% of patients and IgG was positive in 26.7% of patients with acute on chronic liver failure. **Discussion:** HEV infection is a common cause in patients with chronic liver disease and presented with unexplained ACLF. **Recommendation:** based on the current study we recommend searching for HEV infection in patients with ACLF as one of our workup.

Keywords: Acute on chronic liver failure, HEV infection.**Introduction**

One of the commonest causes of viral hepatitis in the world is HEV infection (Kamar et al., 2012). It represent a global health problem where WHO estimates about 20 million HEV infections worldwide per year (Donnelly et al., 2017). Egypt is among the highest prevalence of HEV in the world, which may reach up to 80-90% (Stoszek et al., 2006). There is different variety in clinical presentation of HEV infection both between developing and developed countries and even within the same country, ranging from hepatic to extra hepatic manifestations, where the infection may appear as an asymptomatic self-limited infection, acute infection or acute liver failure. Moreover, HEV infection in patients with underlying liver disease have reported as one of the leading causes for decompensation of pre-existing liver disease with many publications from Asia and Africa, where HEV is endemic (Kumar & Saraswat, 2013)

Aim of the work

The aim of this study was to detect HEV infection in patients with acute on chronic liver failure.

Patient & Methods

This is a cross-sectional study was conducted during the period from December 2018 to December 2019, and included 30 patients attended the outpatient clinic of tropical medicine department, Minia university hospital with acute onset of unexplained jaundice, ascites, coagulopathy, hepatic encephalopathy or abnormal liver biochemical tests and accordingly admitted to the inpatient ward for proper management to fulfill the criteria of ACLF.

All patients fulfilled the following criteria:

Inclusion Criteria:

- patients with unexplained acute exacerbation of chronic liver disease.
- NO limited age group
- Male and female are included.

Exclusion criteria

- patients with history of hepatotoxic drugs before the liver failure.
- patients who are active alcohol abuse to be excluded as a cause of ACLF.
- patients with recent massive blood loss, trauma or surgery.
- patients with active HCV or HBV infection.

All patients were subjected to the following: Detailed history taking and complete clinical examination. Routine laboratory investigations in the form of CBC, Liver function tests (ALT, AST, total and direct bilirubin, INR, albumin and total protein, HCV Abs, HBsAg, HIV testing, Abdominal ultrasound.

Then testing for HEV IgG and IgM by enzyme-linked immunosorbent assay (ELISA) and positive samples tested for HEV RNA (Real time -qPCR).

Results

This study included 30 patients with acute exacerbation of known chronic liver disease are 30, with 20 patients with known liver cirrhosis due to (29 patients were HCV, one patient was cryptogenic cirrhosis) and were decompensated and 10 patients known early chronic liver

disease (chronic hepatitis) by HCV infection and received their therapy, where they presented with ACLF.

30 patients include 24 males and 6 females with median age 58 years [range 49 - 69], showing 33.3% (n=10) diabetic patients and 13.3% (n=4) are hypertensive, smoking in 56.7% and residence in rural areas 53.3%. Demographic characteristics of patients are shown in (Table 1).

Prevalence of HEV infection in the studied patients was; 4 (13.3%) patients positive for anti-IgM and HEV RNA and IgG was positive in 8 (26.7%) patients as in (Table 2)

Laboratory data as in (Table 3) where all cases of IgM positive have elevated levels of ALT, AST and elevated both total and direct bilirubin indicating acute hepatitis and injurious effect on liver in acute infection.

Table (1): Demographic data

		ACLF patients
		N=30
Age	<i>Median</i> <i>IQR</i>	58 (49-69.3)
Gender	<i>Male</i> <i>Female</i>	24(80%) 6(20%)
DM	<i>No</i> <i>Yes</i>	20(66.7%) 10(33.3%)
HTN	<i>No</i> <i>Yes</i>	26(86.7%) 4(13.3%)
Smoking	<i>No</i> <i>Yes</i>	13(43.3%) 17(56.7%)
Residene	<i>Rural</i> <i>Urban</i>	16(53.3%) 14(45.6%)

Table (2): prevalence of HEV infection

N=30 patients

	IgM	IgG	HEV RNA
Positive	4 (13.3%)	8 (26.7%)	4 (13.3%)
Negative	26 (86.7%)	22 (73.3%)	26 (86.7%)

Table (3): Relations between liver function tests and IgM

		Group II		P value
		HEV IgM		
		-Ve	+Ve	
ALT	<i>Normal</i>	0(0%)	0(0%)	----
	<i>Elevated</i>	26(100%)	4(100%)	
AST	<i>Normal</i>	0(0%)	0(0%)	----
	<i>Elevated</i>	26(100%)	4(100%)	
T.bil	<i>Normal</i>	0(0%)	0(0%)	----
	<i>Elevated</i>	26(100%)	4(100%)	
D.bil	<i>Normal</i>	0(0%)	0(0%)	----
	<i>Elevated</i>	26(100%)	4(100%)	
Albumin	<i>Normal</i>	0(0%)	0(0%)	----
	<i>Low</i>	26(100%)	4(100%)	

Discussion

Hepatitis E is one of the most important hygienic infectious problems of the world with a high incidence in developing countries, mainly in Asia and in Africa (Dalton, Bendall, Ijaz, & Banks, 2008). Egypt is among the highest prevalence of HEV in the world, which may reach up to 80-90% (Stoszek et al., 2006) another study in Egypt by Yazbek S, et al., 2016 reported the seroprevalence of HEV in the general population ranges from 2.3 to 37.5% and is higher in males than in females (Yazbek, Kreidieh, & Ramia, 2016). HEV is a common cause of decompensate liver function in patients with chronic liver disease, leading to ACLF resulting in an increased mortality.

We conducted a cross-sectional study that was included and included 30 patients attended tropical medicine department, Minia university hospital with acute onset of unexplained deterioration in liver functions, in the period From December 2018 to December 2019. we aimed to detect HEV infection in patients with acute on chronic liver failure.

In our study The underlying causes of liver disease was 29 cases (96.6%) due to infection with HCV and one case cryptogenic cirrhosis (3.33%) while Steve RJ, et al., 2018 results were in contrast to our study with HCV 0%, cryptogenic 10, ethanol 60% (Steve et al., 2018).

In our study 13.3% n=4 /30 cases are positive for anti-HEV IgM and HEV RNA among ACLF cases and this result is in agreement with a study performed in Egypt where Zaki MES and Othman W 2011 found HEV RNA was detected in the sera of 13/100 patients (13%) of the patients of ACLF (Zaki & Othman, 2011), Steve RJ, et al., 2018 found that HEV is the most common infectious cause of ACLF with an occurrence of 20% and a mortality of 10% (Steve et al., 2018), Skladaný Ľ et al., 2018 also found The prevalence of HEV infection as a trigger of acute decompensation was 9% (Skladaný et al., 2018)

In our study We found, the positive results for HEV IgM and IgG are (13.3 and 26.7% respectively), Zaki MES and Othman 2011 found HEV IgM and IgG are (5 and 30% respectively) (Zaki & Othman, 2011)

When reviewing publications reporting HEV as a leading cause for decompensation, in different endemic areas, HEV-related ACLF have shown a prevalence varying from 8% to 75% (median of 21%) (Kumar & Saraswat, 2013)

Conclusion & Recommendations

From the previous studies we found that HEV infection is a common in our country and can be a cause of acute exacerbation of pre-existing liver disease with occurrence of 13.3% in this study. Based on our findings we recommend searching for HEV infection in patients with chronic liver disease and presented with unexplained ACLF as one of our workup in those patient.

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