An observational study of use of steroid in acute liver injury caused by hepatitis E virus in a tertiary care hospital in Kolkata - a therapeutic challenge

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ABSTRACT:– Hepatitis E virus is one of the leading causes of acute liver failure in clinical situation especially in immune-compromised patients , it has a high incidence in Asian countries and many people died due to lack of proper treatment . In this study , steroid (prednisolone) was used as therapeutic challenge in such patients and significant improvement in clinical and biochemical parameters were found (SGPT , prothrombin time and total bilirubin) . This observational study highlights the possibility of steroid treatment as a therapeutic rescue in patients with hepatitis E. Further studies are required to evaluate whether steroid treatment has a supportive role for patients with HEV induced acute liver injury and improves their spontaneous outcome

Keyword:- hepatitis E , steroid (prednisolone) , SGPT , Prothrombin time

I. INTRODUCTION

Hepatitis E (HEV) is a single-stranded RNA-virus and its genome comprises three overlapping open reading frames . Four human pathogenic HEV genotypes are represented by one serotype. Hepatitis E can induce liver failure and as a consequence, liver transplantation may be required. Most of these fulminant HEV infections are due to endemic genotype 1, especially in pregnant women and patients with chronic liver disease [1,2]. Bernal and Wendon [3] assumed that, globally, hepatitis E infections are one of the most important causes of majority of ALF cases. This can be related to high incidence in some Asian countries. In India, for example, one study reported that 44% of ALF cases were related to hepatitis E virus (HEV) infection. Similar results were obtained in Bangladesh [4,5]. In case series of hepatic failure by hepatitis E genotype 1 and 3, ribavirin has successfully been used to prevent liver transplantation [6,7]. In literature. two case reports of acute hepatitis E claim that steroids may prevent the progress of acute hepatitis E during ALF [8,9] in immunocompromised patients. Further studies are needed to evaluate whether steroid treatment has a supportive role in hepatitis E-related acute liver injury. Descriptions of treatment in ALF are rare although there are occasional reports of successful treatment in acute-on-chronic liver failure [10]. In this study, we report case of acute liver injury caused by HEV virus infection that resolved under steroid treatment .

II. METHOD AND RESULT

A 25 year old hindu female patient was admitted with complaints of loose watery stool for 3to 4 times /day with vomiting for last 1 month. She also complained of yellowish discoloration of eye for 20-25 days .Urine colour was initially dark yellow and now converted to reddish for last few days . It was preceded by headache, fever, and pruritus for last 1 week. No allergies and no herbal or over-the-counter remedies were reported. History of hyperthyroidism was present for which she was treated outside with carbimazole and propanolol but was extremely uncompliant to treatment and did not take medicine for last 6 months .No history of blood transfusion in past .No history of unprotected sexual intercourse .

On examination, there was severe icterus , toxic look , neck swelling with proptosis , pulse rate was 110 bpm and supine BP -120/65 mmHg. On admission, laboratory results revealed an acute liver injury with transaminitis. Additional laboratory result showing elevated CRP (16 mg/L ,N = <5 mg/L) , normal total count . Abdominal ultrasound showed no signs of liver cirrhosis or intrahepatic masses. Ascites was absent. The gall bladder wall was slightly edematous. As patient had also history of hyperthyroidism , we suspected that autoimmune etiology might be there . In the mean time IgM Hep A was negative and also negative for HbsAg and anti HCV. All serology markers including ANA ,anti LKM1 , ASMA , anti SLA were negative . IgM Hep E was found to be positive in high titre . So this was diagnosed to be a case of acute hepatitis due to Hepatitis E .

We put the patient on symptomatic therapy for hepatitis, but after 3 days , transaminase level and total bilirubin were elevated . Patient also became mild drowsy . prothombin time was raised and we suspected it turned into impending acute liver failure . On 5 the day, we started tab. prednisolone (1mg/kg = 40 mg /d) and along with symptomatic treatment . Just few days after starting steroid, ALT level was going to be decreased surprisingly (table I). Patient was still in same condition without symptomatic improvement. After 4 day, patient gradually became responsive and prothrombin time was decreasing. Patient was very sick and it was planned for continuing steroid as patient responded to treatment .1 week after therapy , transaminase and prothrombin time was reduced to satisfactory level but total bilirubin was still in higher range . From beginning of 2 wk, total bilirubin was going to be deceased and we reduced dose to 20mg/d , patient was now well , total bilirubin on 3rd week became less than 10 mg/dl. Dose was decreased to 10 mg/d on 4th week and we planned for short tapering dose of steroid and to stop steroid within 1.5 month . On discharge patient was completely asymptomatic with LFT profile was absolutely normal.

After this success, few other patients (n=6) with hepatitis E with acute liver injury (including one pregnant) also received steroid and treated successfully . SGPT, total bilirubin and PT were assessed at day of admission, on day 7 before starting steroid and on day 28 after starting steroid . There was a gradual decrease in all biochemical values after starting treatment (FIGURE 1,2 ,3)

III.   TABLE AND FIGURE

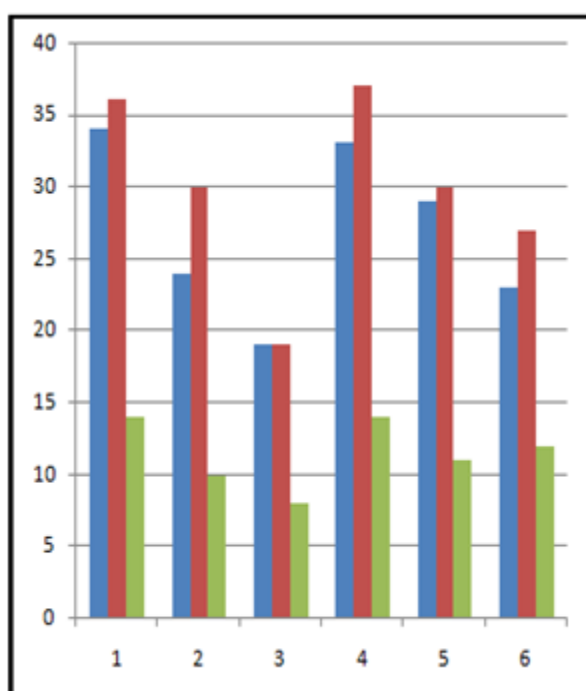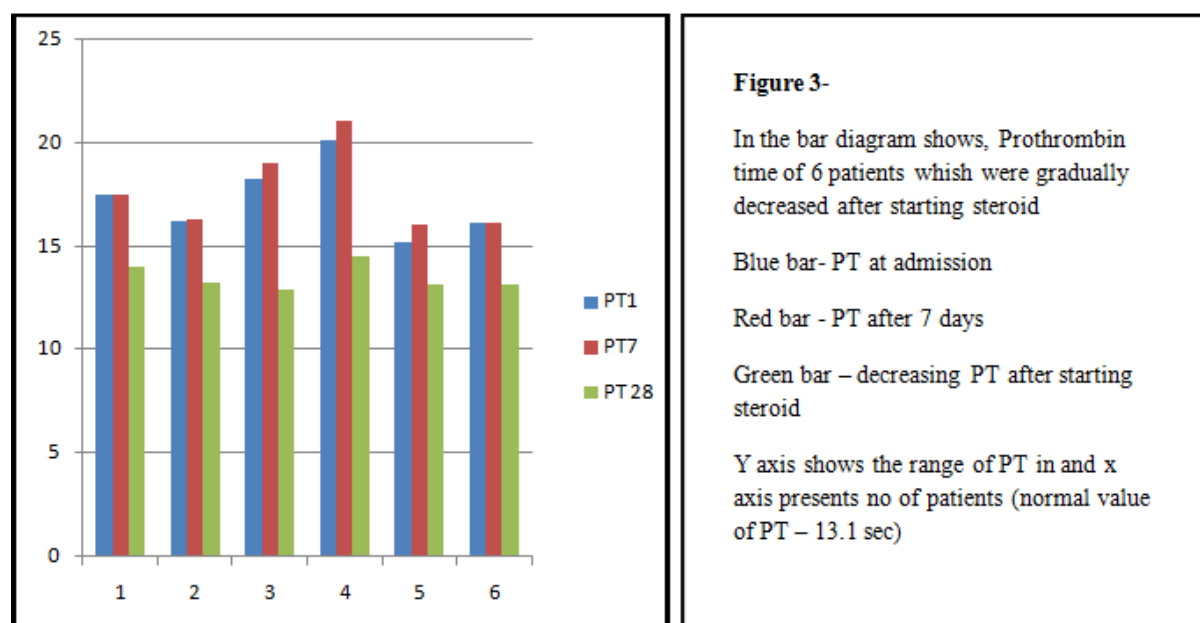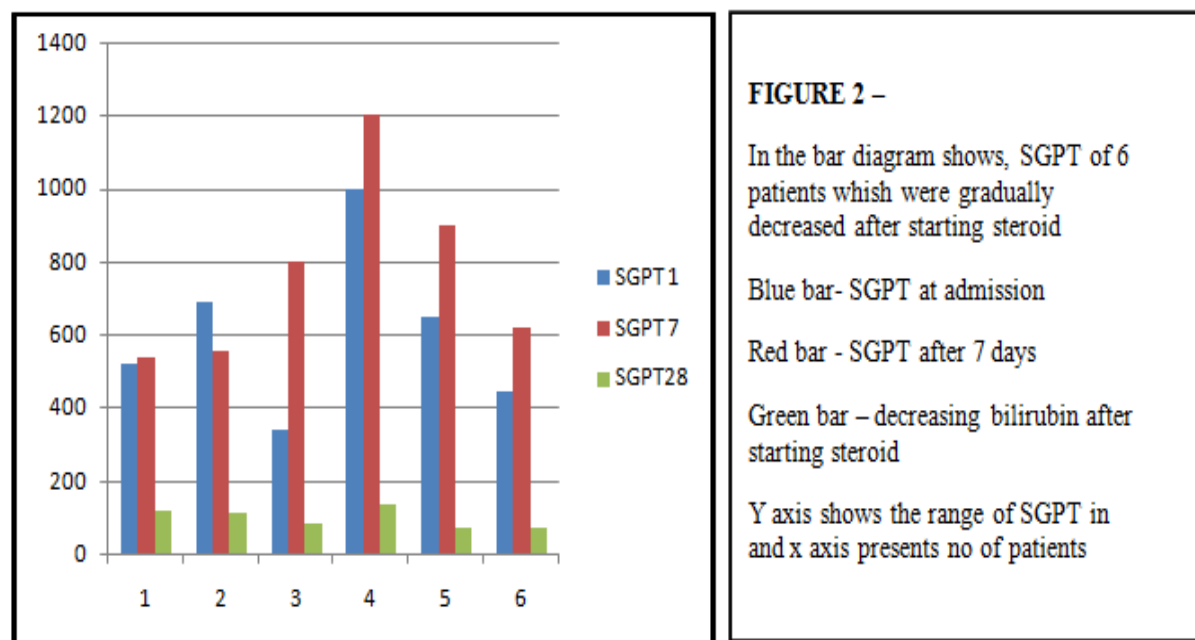| Variables	Admission	After 3 week	Steroid started , after 1 wk	After 2 week	At discharge
Hb	8.0	7.5	8.9	9.1	10.0
WBC	4500	4200	5900	8500	8560
PT-INR	20.5	21.5	17.2	14.2	14.0
TB	28.9	36.0	22.5	16.9	3.0
DB	10.1	20.4	12.9	9.8	1.4
SGOT	204	200	163	143	73
SGPT	560	456	98	72	61
ALP	112	123	140	108	119
TP	6.8	6.3	5.3	6.1	6.1
Alb	3.4	3.5	3.0	3.5	3.4
CRP	16	10	9	9	6

FIGURE 1- In the bar diagram shows, total bilirubin of 6 patients whish were gradually decreased after starting steroid

Blue bar- total bilirubin at admission

Red bar – total bilirubin at 7 days

Green bar – decreasing bilirubin after starting steroid

Y axis shows the range of bilirubin in mg/dl and x axis presents no of patients

FIGURE 2 –

In the bar diagram shows, SGPT of 6 patients whish were gradually decreased after starting steroid

Blue bar- SGPT at admission

Red bar - SGPT after 7 days

Green bar – decreasing bilirubin after starting steroid

Y axis shows the range of SGPT in and x axis presents no of patients

Figure 3-

In the bar diagram shows, Prothrombin time of 6 patients whish were gradually decreased after starting steroid

Blue bar- PT at admission

Red bar - PT after 7 days

Green bar – decreasing PT after starting steroid

Y axis shows the range of PT in and x axis presents no of patients (normal value of PT – 13.1 sec)

IV. DISCUSSION

Approximately 20–40% of acute liver failure cases are caused by HEV infections in developing countries. However, recent studies showed HEV seroprevalence rates between 16 and 20% among adults in industrialized countries . One retrospective study from Germany suggests that hepatitis E contributes to a substantial proportion of acute liver injury cases in developed countries [11,12]. In immunocompetent patients, HEV infection usually takes an asymptomatic course [13]. In contrast to descriptions of a higher incidence of chronic hepatitis E in immunocompromised patients, two case reports of acute hepatitis E claim that steroids may prevent the progress of acute hepatitis E during ALF. In one study , it demonstrates that short-term steroid medication might be beneficial in HEV-induced acute liver injury, especially considering that even in HEV infection acute liver injury is likely immune-mediated and not due to the viral replication per se [14]. A full literature research revealed another case report describing recovery from HEV infection under immunosuppressive treatment [15]. In this study , we found that 6 patients with diagnosed to be acute liver failure due to hepatitis E were treated with steroid and showed significant improvement both clinically and biochemically . Though in this study. few patients were considered as study population , study with more patients are required in future to establish defilnite role of steroid in acute liver injury by hepatitis E .

IV.   CONCLUSION

This observational study highlights the possibility of steroid treatment as a therapeutic rescue in patients with hepatitis E. Further studies are required to evaluate whether steroid treatment has a supportive role for patients with HEV induced acute liver injury and improves their spontaneous outcome. Future studies are required to establish a definitive role of steroid in acute liver failure by hepatitis E with more study population .

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Conflict of interest – none

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