OPEN ACCESS

Saudi Journal of Medicine

Abbreviated Key Title: Saudi J Med
ISSN 2518-3389 (Print) |ISSN 2518-3397 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Case Report

A Case Report- Therapeupic Plasma Exchange in a Case of Alcohol Induced Acute On Chronic Liver Failure

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DOI: 10.36348/sjm.2021.v06i12.004 | **Received:** 13.11.2021 | **Accepted:** 18.12.2021 | **Published:** 24.12.2021

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Abstract

A Case Report: A 26 year old, male admitted under Department of Gastroenterology, AIIMS Rishikesh with complaint of Jaundice since 25 days associated with fatigue & malaise. Patient also complained of gradual abdominal distention with pedal edema & decrease in urine output for 3 days & altered sensorium for 1 day. Patient was a chronic alcoholic consuming 100gms/day for 18years. Initially, on admission patient had stable vitals but increased prothrombin time, with raised serum bilirubin (44mg/dl). Serum electrolytes on admission were also altered. Patient was managed with TPE along with diuretics, antibiotics, steroids & protein supplements. 5 TPE procedures were done every alternate day with Fresh Frozen Plasma & 4% Albumin as replacement fluids. In this case, prothrombin time and serum bilirubin improved significantly after 5th procedure. Urine output and sensorium were also improved. Patient was discharged from the hospital with improved clinical symptoms and stable vitals.

Keywords: TPE, Acute Liver Failure, Plasma Exchange.

INTRODUCTION

The liver plays critical role in synthesis of proteins and coagulation factors, and clearance of biliary excretory substances and toxic metabolites. ACLF has been identified as a distinct syndrome due to acute decompensation of liver cirrhosis accompanied by extra-hepatic organ failure, predominantly caused by an overwhelming systemic immune response [1]. In line with this hypothesis, several studies have shown that this acute and often massive necrosis of hepatocytes is triggered by the release of proinflammatory cytokines and is associated with poor prognosis in ALF [2].

Such patients are initially managed with symptomatic treatment by blood components for coagulopathy and anemia, antibiotics for infection control and by supplementing optimal nutrition. Conservative treatment of liver failure is less effective yet treatment of choice dueto shortage of liver donors for transplantation. Extracorporeal removal of circulating causative agents has shown to be a beneficial therapeutic option in such patients [3]. Therapeutic plasma exchange (TPE) is an intervention that: a) modulates the immune response causing multi organ failure by removing damage associated molecular patterns (DAMPs)and cytokines, accumulated toxins in plasma. (b) supports the failing liver by replacing coagulation factors and maintaining the fluid balance, thus improving the coagulation profile [1, 4]. Numerous studies have shown that TPE is a safe option in patients with ALF as it significantly reduces the concentration of ammonia thus improving deranged hemodynamic. As per the current guidelines established by the American Society for Apheresis (ASFA), “TPE in acute liver failure is a category 1 recommendation that supportive care until spontaneous recovery occurs or a

liver allograft becomes available for liver transplantation [5].

This case study shows effect of TPE in a case of ACLF analyzing the outcomes of the TPE procedures performed in this acute liver disease patient by determining the improvement in clinical and laboratory parameters.

CASE REPORT

A 26 year old male was admitted under department of Gastroenterology, AIIMS Rishikesh with complaint of yellowish discoloration of eyeballs for 25 days associated with fatigue & malaise. Patient also complained of gradual abdominal distention with pedal edema, decreased urine output & altered sensorium for 1 day. Patient was chronic alcoholic consuming 100gms/day for 18years. Initially, on admission patient had stable vitals but increased prothrombin time (PT), elevated serum bilirubin (44mg/dl), Blood urea nitrogen (BUN) (70mg/dl) and altered serum elec. on admission. Patient was not found to have any UGI bleed on examination.

In view of the above findings, treatment plan of TPE (every alternate day) was planned with replacement fluid as Fresh Frozen Plasma (FFP) and 4% Albumin. Additionally, diuretics, antibiotics, Steroids, and protein supplements were given.

Improvement was noted after the 5 cycles of TPE in this case. PT (17 seconds) and serum bilirubin (26 mg/dl) improved significantly. Improvement in Urine output and sensorium was noted from 2nd procedure onwards. Clinically, significant reduction in pedal edema and ascites was also observed after 3rd procedure. The clinical improvement along with laboratory parameters is shown in Table 1.

Table 1: Clinical improvement (changes observed in symptoms, signs and lab. parameters)

1st TPE	5th TPE
Yellow discoloration of eyes & skin- present	Reduced significantly
Altered Sensorium	Conscious to time, place and person
Ecchymosis present	Improved
Malena	No such complaints after day of admission
Serum total bilirubin- 44mg/dl	26 mg/dl
Direct bilirubin- 43mg/dl	11.89 mg/dl
*SGPT - 62 U/L	60U/L
*SGOT - 145 U/L	112U/L
*ALP -158 U/L	57 U/L
*GGT –171 U/L	58 U/L
PT -25 seconds, INR- 2.44	17 seconds, 1.98
Serum Albumin -2 g/dl	3.22 g/dl

*SGPT-Serum glutamic pyruvic transaminase
*SGOT - serum glutamic-oxaloacetic transaminase
*ALP – Alanine aminotransferase
*GGT – Gamma glutamyl transferase

Patient was discharged from the hospital with improved clinical symptoms and stable vitals.

DISCUSSION

In patients with severe liver disease, accumulation of toxic metabolites such as bilirubin, ammonia and various endotoxins can lead to severe complications hindering the function of hepatocytes, consequently progressing to hepatic failure [2, 6]. TPE helps maintain cerebral perfusion pressure and aids in removing these toxic substances from the patient's plasma. FFP administered as replacement fluid, helps replenish essential coagulation factors, albumin, and immunoglobins. This process significantly improves the microenvironment of the liver, which in turn accelerates functional recovery and regeneration of hepatocytes [7]. The main goals of liver support systems are to improve the abnormal coagulopathy and prevent complications of additional end organ damage in individuals with liver failure. TPE has been observed to improve altered consciousness and normalize hyperkinetic circulation by removal of dialyzable neurotoxic substances from the systemic circulation. In the present study, PT, S. bilirubin, and INR levels improved significantly with the TPE. These findings were comparable to the study by Singer *et al*., who observed the bleeding diathesis was controlled with the correction of the coagulation profile in ALF patients, when FFP was used as the replacement fluid in TPE [8].

TPE seems to be an effective approach for clearing accumulated anticoagulant toxins from the circulation and second, it is a result of replacement of clotting factors during TPE [8, 9]. The dilutional effect of plasmapheresis on decreasing the serum aminotransferases and bilirubin levels was well demonstrated by Singer *et al*., In the present study, the initial serum aminotransferases and total bilirubin levels were significantly improved after TPE [8, 10]. Early TPE was found beneficial in this patient which

correlates with a study by Bektas *et al*., which also states the similar fining [11]. TPE was well tolerated. No serious adverse effects or any transfusion reactions, to treatment were observed during or after completion of TPE.

CONCLUSION

In conclusion, TPE seems to be effective in improve the clinical signs and symptoms which can be correlated with improved laboratory parameters in a case of Alcohol induced ACLF clinically.

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