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Case Report
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Living-donor liver transplant for HAV induced acute liver failure

A Redekar S.[1], Misra S.[2*]

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[1] Swanand A Redekar, DNB Medical Gastro Final Year Trainee, Shivani hospital and IVF Research Center, Kanpur, Uttar Pradesh, India.

[2*] Shivanshu Misra, Consultant Bariatric Surgery and Advanced Laparoscopic Surgeon, Shivani hospital and IVF Research Center, Kanpur, Uttar Pradesh, India.

Though HAV infection is prevalent in the general population, HAV-induced ALF is very rare.ALF due to HAV are more common in elder patients' group, and it has a worse prognosis. A 23-year-old south Indian male presented with fever, jaundice, and malaise, who had positive anti HAV IgM antibodies, developed hepatic encephalopathy which ultimately led to a diagnosis of acute liver failure due to acute hepatitis A virus infection. Despite the failure of supportive treatment, he was managed successfully with a living donor liver transplant.

Keywords: Acute liver failure (ALF), HAV (Hepatitis A Virus), Living donor liver transplant

Corresponding Author

Shivanshu Misra, Consultant Bariatric Surgery and Advanced Laparoscopic Surgeon, Shivani hospital and IVF Research Center, Kanpur, Uttar Pradesh, India.
Email: shivanshu_medico@rediffmail.com

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Introduction

Acute liver failure (ALF) is defined by the presence of coagulopathy (International Normalized Ratio ≥ 1.5) and hepatic encephalopathy due to severe liver damage in patients without preexisting liver disease with the disease course of 26 weeks or less. Less than 1% of acute HAV (Hepatitis A Virus) infections result in ALF but has a high mortality rate. Hepatitis A infection follows a more severe course in adults and chronic liver disease patients compared with children and usually results in a hyperacute or acute pattern of liver failure. For those who do not respond to supportive treatment, a liver transplant (LT) is a life-saving option. The best-reported literature support for LT in HAV Related ALF, states 5-year survival of 69%. According to the best of our knowledge, there is no report of a similar case in the literature from India. With this we report a rare example of hepatitis A virus-related ALF, not responding to supportive treatment, rescued by living donor liver transplant [1,2].

Case report

A 23-year south Indian male presented with complaints of fever, jaundice, malaise for five days. The patient was not consuming alcohol, didn't had any history of any drug intake or blood transfusions. On examination, he was conscious, oriented with icteric tinge without any signs of CLD (Chronic Liver disease).

Course in hospital

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Investigations- His blood investigations revealed deranged LFTs (Liver function tests) (TB- 5.6,AST-7860, ALT-6960, ALKP 152, PT-109,INR-7.79,ALB-3.9) while imaging studies were normal. He was reactive for IgM anti-HAV antibodies, while all other virological workup was negative. His ceruloplasmin levels, iron profile, and autoimmune workup were normal.

Treatment- The patient was hospitalized and put on supportive liver treatment. On day 3, the patient became drowsy and developed flaps. The patient was shifted to the Intensive Care Unit (ICU) and was treated with standard protocol for ALF. However, the patient responded poorly to treatment and deteriorated neurologically. On the next day, the patient was electively intubated and taken on mechanical ventilation. According to King's college criteria for liver transplant in ALF (non-acetaminophen ALF, INR >6.7), the option of LDLT was considered, and after a thorough discussion with family, the patient underwent right lobe living-donor liver transplant on day 7th after admission. (Donor was 2nd degree relative of the patient).

Postoperative course: Postoperatively his liver function tests started improving from the second postoperative day. Oral feeds were started on day 3 and the patient was discharged on day 10th postoperatively with normal LFTs.The resected liver specimen was shrunken (750gm) & HPE showed extensive areas of necrosis and interface hepatitis.

Discussion

Acute liver failure is a critical medical condition defined as the rapid development of hepatic dysfunction associated with encephalopathy. The prognosis in these patients is highly variable and depends on the etiology, interval between jaundice and encephalopathy, age, and the degree of coagulopathy. Determining the prognosis for this population is vital. Unfortunately, prognostic models with both high sensitivity and specificity for prediction of death have not been developed. Liver transplantation has dramatically improved survival in patients with acute liver failure. Still, 25% to 45% of patients will survive with medical treatment. The identification of patients who will eventually require liver transplantation should be carefully addressed through the combination of current prognostic models and continuous medical assessment Although overall outcomes after liver transplantation for acute liver failure are improving, they are not yet comparable to elective Transplantation [1]. Lee WM et al in their paper on acute liver failure concluded that as an acute liver failure (ALF) is an orphan disease, large clinical trials are impossible and much of its management is based on clinical experience only. Nonetheless, there are certain issues that continue to recur in this setting as well as growing consensus (amidst innovation) regarding how to maximize the ALF patient's chance of recovery. The changes in ALF management are not global in nature but are more consistent with incremental experience and improvements in diagnosis and intensive care unit management [2]. Bernal W et al worked on the use and outcome of liver transplantation in acetaminophen-induced acute liver failure. In the present study, we examined the application and outcome of OLT in 548 patients admitted to a single-center Survival was greatest in those receiving unreduced grafts, and markers of early graft function differed significantly between survivors and non-survivors. Liver transplantation is an effective treatment in a relatively small number of patients with acetaminophen-induced hepatotoxicity, and for a substantial proportion, transplantation was never an option because of the rapidity of clinical deterioration. APACHE III scoring may be of value in decision making and in better defining patients in clinical trials [3]. Wasley A et al threw light on Hepatitis A in the era of vaccination. The World Health Organization estimates an annual total of 1.5 million clinical cases of hepatitis A worldwide, but seroprevalence data indicate that tens of millions of hepatitis A virus infections occur each year. Hepatitis A vaccination will probably remain a low priority for some time in the poorest countries, where most persons are infected as young children. However, shifts in the epidemiologic patterns of disease associated with declining hepatitis A virus transmission are occurring in many regions of the world. These shifts are likely to create circumstances where strategically targeted vaccination of children could produce substantial public health benefits [4]. Taylor RM et al studied the incidence, prognosis, and outcomes of hepatitis. Acute liver failure (ALF) due to the hepatitis A virus (HAV) infection is an uncommon but potentially lethal illness. The aim of this study was to identify readily available laboratory and clinical features associated with a poor prognosis among ALF patients with HAV infection. A prognostic model incorporating 4 presenting features (serum ALT <2,600 IU/L, creatinine >2.0 mg/dL, intubation, pressors) had an AUROC for transplant/death of 0.899 which was significantly better than the King's

College criteria (0.623, *P* = .018) and MELD scores (0.707, *P* = .0503). Between 1988 and 2005, the frequency of patients requiring liver transplantation for HAV in the UNOS database significantly decreased from 0.7 % to 0.1%. A prognostic index consisting of 4 clinical and laboratory features predicted the likelihood of transplant/death significantly better than other published models suggesting that disease-specific prognostic models may be of value in non-acetaminophen ALF [5]. Vento S et al found that fulminant hepatitis associated with hepatitis A virus superinfection in patients with chronic hepatitis C. There are limited data on the course of this infection in patients with chronic hepatitis B and chronic hepatitis C. Although most patients with chronic hepatitis B who acquired HAV infection had an uncomplicated course, patients with chronic hepatitis C had a substantial risk of fulminant hepatitis and death associated with HAV superinfection. Their data suggest that patients with chronic hepatitis C should be vaccinated against hepatitis A [6]. McPhail MJ et al did a meta-analysis of the performance of Kings's College Hospital Criteria in the prediction of outcome in non-paracetamol-induced acute liver failure. Their performance in the identification of patients with non-paracetamol-induced ALF (non-POD ALF), who would not survive without ELT, has recently been questioned. KCC for outcome in non-POD ALF has good specificity and more limited sensitivity. There is significant heterogeneity in the published data partially related to methodological quality. KCC performs best in groups with high-grade encephalopathy and in historically earlier studies suggesting modern medical management of ALF may modify the performance of KCC [7]. Ciocca M et al also studied Hepatitis A as an etiologic agent of acute liver failure in a prospective, multicenter study, and examined the importance of hepatitis viruses as etiological agents of acute liver failure (ALF) and the outcome of ALF cases in Latin American children and adolescents. They also concluded that HAV was the main etiologic agent of ALF in the population studied [8]. Jung DH et al studied outcome comparison of liver transplantation for hepatitis A-related versus hepatitis B-related acute liver failure in adult recipients. This study compares outcomes between liver transplantation (LT) for HAV-related ALF (HAV-ALF) and LT for hepatitis B virus (HBV)-related ALF (HBV-ALF). Multivariate analyses demonstrated that acute pancreatitis and HAV recurrence were independent risk factors of graft and patient survival. The post-transplant outcome was poorer in patients with HAV-ALF than in those with HBV-ALF. This weakens LT's appropriateness in HAV-ALF patients with pancreatitis. HAV recurrence after LT for HAV-ALF is common and often fatal; thus, HAV recurrence should be monitored vigilantly, beginning early post-transplant [9].

Conclusion

A liver transplant can successfully rescue HAV associated sever ALF in highly-selected patients.

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