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ACUTE LIVER FAILURE WITH PROLONGED CHOLESTASIS FOLLOWING HEPATITIS AINFECTION IN A CHILD: A RARE CASE REPORT

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ABSTRACT

We report the case of a 7-year-old female who presented with acute liver failure secondary to hepatitis A virus infection. The acute phase was characterized by high-grade fever, vomiting, icterus, hepatosplenomegaly, hyperbilirubinemia, hyperammonemia, and coagulopathy. She was managed in the paediatric intensive care unit with intravenous N-acetylcysteine, lactulose, vitamin supplementation, ursodeoxycholic acid, and supportive measures, leading to biochemical improvement and symptom resolution. Uniquely, despite marked clinical recovery, she developed prolonged cholestasis during follow-up, with persistent conjugated hyperbilirubinemia ,with direct bilirubin of 10.79 even 8 weeks post-discharge. This case underscores that, although hepatitis A–induced ALF usually resolves completely, rare presentations with prolonged cholestasis may occur, necessitating prolonged monitoring and targeted management.

BACKGROUND

Hepatitis A virus (HAV) is a non-enveloped RNA virus of the Picornaviridae family, transmitted predominantly via the faeco–oral route through contaminated water or food [1]. Globally, HAV remains an important cause of acute viral hepatitis, especially in low- and middle-income countries where sanitation and hygiene measures are suboptimal [2,3]. In children, HAV infection is often asymptomatic or presents as a mild self-limiting illness; however, a small proportion can develop acute liver failure (ALF), a condition defined by acute onset hepatic dysfunction, coagulopathy, and encephalopathy in the absence of pre-existing liver disease [4,5].

Paediatric ALF secondary to HAV accounts for a significant proportion of acute hepatitis-related ICU admissions in endemic regions [6]. The pathophysiology involves a combination of direct viral cytopathic effects and immune-mediated hepatocellular injury leading to massive hepatocyte necrosis [7]. While the majority recover spontaneously, ALF can progress rapidly and carries a risk of cerebral oedema, multi-organ dysfunction, and death without timely intervention [8].

Early diagnosis is crucial, requiring a combination of clinical suspicion, liver function assessment, and serological confirmation [4,9]. Supportive management remains the cornerstone, including meticulous fluid balance, correction of coagulopathy, prevention of encephalopathy, and nutritional optimisation [5,10]. The role of N-acetylcysteine in non-paracetamol ALF, including HAV, is increasingly recognised for its antioxidant and hepatoprotective effects [11]. Preventive measures, notably vaccination, have demonstrated effectiveness in reducing HAV incidence in high-risk populations [12,13].

This case highlights the importance of prompt recognition, early PICU admission, and aggressive supportive therapy in achieving complete recovery in paediatric HAV-related ALF.

CASE PRESENTATION

A 7-year-old female, previously healthy, developmentally normal child presented with a four-day history of high-grade, intermittent fever relieved by antipyretics,multiple episodes of non-bilious vomiting, abdominal pain and yellowish discoloration of skin .Immunisation was up-to-date as per the National ImmunisationSchedule ,optional vaccines were not given .There was also history of similar complaints in family -her brother who was diagnosed to have hepatitis A Infection 1 week back and was treated in ICU for the same complaints .

On examination, she was alert, febrile, and icteric, with stable vital signs. There was no pallor, cyanosis, clubbing, or lymphadenopathy. Abdominal examination revealed soft hepatosplenomegaly. The remainder of systemic examination was unremarkable.

Figure 1: Clinical photograph of the patient showing marked icterus.

Figure 2. extensive Scratch marks in legs noted in hepatitis.

Given the acute presentation and presence of icterus with hepatosplenomegaly, baseline laboratory work-up was performed. This revealed markedly deranged liver function tests, hyperbilirubinemia, elevated serum ammonia, and prolonged prothrombin time with INR elevation. A diagnosis of acute liver failure secondary to viral hepatitis A was made, supported by positive HAV serology.She was admitted to the paediatric intensive care unit for close monitoring and management.

INVESTIGATIONS

Initial laboratory evaluation demonstrated elevated serum bilirubin, markedly raised transaminases, and deranged coagulation profile (prolonged PT/INR).

Total bilirubin -8.49 mg/dl ,direct bilirubin -7.11 mg/dl ,AST-1346 U/L,ALT-2394 U/L,GGT-199 U/L
Prothrombin time -16.2 sec ,INR-1.32

Serum ammonia was elevated at 136 µmol/L. Hepatitis A IgM was positive; other viral hepatitis markers (HBsAg, anti-HCV) were negative. Complete blood count and renal function tests were within normal limits. Abdominal ultrasound revealed hepatosplenomegaly with preserved hepatic architecture and no biliary obstruction. Serial liver function tests during admission showed a gradual decline in aminotransferase levels. Repeat coagulation profile after vitamin K and supportive therapy demonstrated normalisation. Follow-up ammonia levels also decreased progressively, correlating with clinical improvement.

At discharge child's AST-96 ,ALT-222 ,but child had persistent direct hyperbilirubinemia with total bilirubin of 6.67 mg/dl and direct bilirubin of 5.82 mg/dl

On follow up of child after 8 weeks child continued to have direct hyperbilirubinemia with resolving transamnitis,with peak direct bilirubin of 10.79 mg/dl.

DIFFERENTIAL DIAGNOSIS

In a child presenting with acute onset fever, vomiting, icterus, and hepatosplenomegaly, the primary consideration is acute viral hepatitis. Our first differential was hepatitis A, given the epidemiological context, acute presentation, and confirmed positive HAV IgM serology. Hepatitis B and E were excluded based on negative serological markers. Autoimmune hepatitis, though possible in this age group, was considered less likely in view of the abrupt onset, absence of chronic symptoms, and serological confirmation of HAV. Wilson disease is an important cause of paediatric ALF, but the lack of neurological symptoms, absence of haemolyticanaemia, and acute HAV positivity allowed us to rule it out without extensive copper studies at presentation. Drug-induced liver injury was improbable, as there was no history of hepatotoxic drug ingestion. Sepsis-related cholestasis was considered but excluded due to absence of systemic signs of sepsis and negative cultures. Leptospirosis and malaria were considered given endemicity; however, negative serology and peripheral smear findings ruled them out. Thus, after systematically excluding other causes, HAV-induced ALF was confirmed as the final diagnosis.

TREATMENT

She received intravenous N-acetylcysteine infusion at a dose of 300 mg/kg for 3 days, ursodeoxycholic acid (150 mg twice daily at a dose of 8 mg/kg/day), lactulose syrup for ammonia reduction, vitamin K (10 mg IV daily), and fat-soluble vitamin supplementation (A, D, E). Hepatic-protective fluids, intravenous cefotaxime, ondansetron, and proton pump inhibitors were given as required. Dulcolax suppository was used for bowel regulation. Coagulopathy normalised with supportive therapy.

By day 7, the child was afebrile, appetite improved, icterus reduced, and laboratory tests showed declining bilirubin and improving coagulation parameters. She was discharged on ursodeoxycholic acid (300 mg twice daily) and vitamin D supplementation for 2 weeks, with advice on hydration, diet, and hygiene

OUTCOME AND FOLLOW-UP

Notably, during follow-up, although the child maintained good appetite, energy levels, and weight gain, she continued to have persistent conjugated hyperbilirubinemia ,with peak direct bilirubin of 10.79 at 8 weeks post-discharge, indicating prolonged cholestasis. Pruritus was managed with ongoing ursodeoxycholic acid and antihistamines. Dose of ursodeoxycholic acid was increased upto 23 mg/kg/day .Repeat liver ultrasound showed stable hepatic echotexture with mild hepatomegaly and no biliary obstruction. Over time, gradual biochemical improvement was noted, though cholestasis persisted beyond the usual convalescent phase.

DISCUSSION

Hepatitis A virus infection in children is typically self-limiting, with complete resolution of symptoms and biochemical abnormalities within weeks [1,3]. While acute liver failure (ALF) is a recognised but rare complication [4,6], **prolonged cholestasis following HAV-induced ALF is even less common**.

The mechanism of cholestasis in hepatitis A is thought to involve inflammatory injury to the intrahepatic bile ducts, canalicular cholestasis, and possible immune-mediated disruption of bile flow [7,8]. Prolonged cholestasis is defined as persistence of jaundice and biochemical cholestasis beyond 4–6 weeks after the onset of illness [9]. Clinically, it may present with pruritus, pale stools, dark urine, and persistently elevated conjugated bilirubin despite recovery in other hepatic functions.

Our patient's presentation was unusual for two reasons:

Biphasic illness — initial severe presentation with ALF requiring PICU admission, followed by a recovery phase complicated by persistent cholestasis.

Good clinical status despite biochemical abnormality — appetite, weight, and activity improved while bilirubin levels remained elevated.

This pattern suggests that in certain patients, cholestasis may persist as an isolated biochemical abnormality without functional compromise. In such cases, supportive management with ursodeoxycholic acid, nutritional supplementation, and symptomatic treatment for pruritus is generally sufficient [10,11].

Alebaji *et al.* reported a 14-year-old girl who developed conjugated hyperbilirubinemia several weeks after recovery from acute hepatitis A; liver biopsy revealed hepatitis with cholestasis, and she achieved full recovery with conservative management .This emphasizes that, although hepatitis A is usually self-limiting, clinicians should be aware of the potential for prolonged cholestatic presentations and their generally favorable prognosis with supportive care.(16)

Meyer *et al.* described a 36-year-old woman who developed severe pruritus and jaundice three weeks after an initially uncomplicated hepatitis A episode, with relapse of infection being excluded. Conventional therapy, including cholestyramine, antihistamines, naloxone, and ursodeoxycholic acid, was ineffective; however, plasmapheresis combined with rifampicin led to gradual symptomatic and biochemical improvement, allowing discharge after four sessions.(17)

The prognosis of prolonged cholestasis after HAV is excellent, with eventual resolution over several months [12]. However, long-term follow-up is recommended to monitor for rare sequelae such as post-hepatitis syndrome or autoimmune cholangiopathy [13,14].

This case emphasizes that in endemic settings, HAV can not only cause ALF but also result in **protracted cholestatic hepatitis**, even in children with otherwise complete clinical recovery. Awareness of this entity can prevent unnecessary invasive investigations and guide appropriate follow-up.

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LEARNING POINTS

- ✓ Hepatitis A infection can rarely cause a **biphasic illness** — acute liver failure followed by prolonged cholestasis.
- ✓ Clinical recovery may precede biochemical normalization in paediatricHepatitis A infection
- ✓ Prolonged cholestasis usually resolves spontaneously but requires extended follow -up.
- ✓ Ursodeoxycholic acid and symptomatic antipruritic therapy are effective supportive measures .

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