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Research Article

Clinical Profile, Etiology, and Outcomes of Acute Viral Hepatitis in Children: A Prospective Study at a Peripheral Tertiary Care Center

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ABSTRACT
Background: Acute viral hepatitis (AVH) remains a major pediatric health issue in developing countries. Managing AVH in peripheral tertiary care teaching hospitals serving rural communities presents distinct challenges due to limited access to advanced molecular diagnostics. This study evaluated the clinical profile, basic serological etiology (HAV and HBV), sonological findings, and management outcomes of pediatric AVH, accounting for patient disposition including transfers and dropouts.
Methods: A prospective observational study was initiated on 96 pediatric patients aged 1 to 15 years admitted with acute viral hepatitis to the Department of Pediatrics at Koppal Institute of Medical Sciences (KIMS), Koppal. Serological evaluation was focused on essential markers (IgM anti-HAV, HBsAg, and IgM), Patients who took Discharge Against Medical Advice (DAMA, n=2) or required transfer to a higher super-specialty center for advanced liver support (n=4) were documented and excluded from final local outcome analysis. The remaining 90 patients who completed local treatment and follow-up were analyzed across three age groups (1–5, 6–10, and 11–15 years).
Results: Out of 96 total enrolled cases, 2 cases left against medical advice (DAMA) and 4 cases with progressive acute liver failure (ALF) were referred to a higher center for pediatric gastroenterology evaluation. Among the 90 patients analyzed for final outcome, 50 (55.6%) were boys and 40 (44.4%) were girls. Hepatitis A virus (HAV) was identified in 81 cases (90.0%) and Hepatitis B virus (HBV) in 9 cases (10.0%). Major presenting symptoms were jaundice (91.1%), dark urine (86.7%), anorexia (83.3%), vomiting (72.2%), and fever (66.7%). Pre-hospital traditional herbal medicine intake was noted in 61 cases (67.8%). Locally managed ALF developed in 6 cases (6.7%), all of whom recovered with supportive PICU care
Conclusions: Hepatitis A is the main cause of pediatric AVH in rural North Karnataka. Timely identification of severe illness allows appropriate early referral of high-risk cases to higher centers, while structured supportive care at the peripheral tertiary level achieves complete recovery for the majority of children.

INTRODUCTION

Viral hepatitis is a major cause of pediatric morbidity and public health strain in developing nations. The illness is predominantly caused by classical hepatotropic viruses, with Hepatitis A (HAV) and Hepatitis B (HBV) accounting for the primary vaccine-preventable burdens in pediatric practice. Environmental factors such as inadequate sanitation, overcrowding, and unhygienic water supply in rural and semi-urban catchment areas drive sporadic AVH transmission. While HAV infection in young children is usually self-limiting, it can occasionally progress to acute liver failure (ALF).

At peripheral tertiary care medical colleges like the Koppal Institute of Medical Sciences (KIMS), Koppal, pediatric services operate under logistical and infrastructural constraints. Extended serological workups (Hepatitis E and Hepatitis C kits), real-time viral load PCR assays, non-hepatotropic viral testing, and pediatric liver transplant units are not available

on-site. Furthermore, widespread community reliance on unstandardized traditional herbal preparations prior to hospital consultation frequently delays timely medical evaluation. In peripheral healthcare settings, patient management is also impacted by social factors leading to Discharge Against Medical Advice (DAMA) or the necessity to refer deteriorating patients to higher centers for advanced care.
This study was undertaken to analyze the clinical spectrum, basic serological etiology, laboratory features, and hospital outcomes of pediatric AVH at KIMS Koppal, explicitly accounting for cases referred to higher centers and those lost to follow-up due to DAMA.

METHODOLOGY

Study Design and Setting

This retrospective study was conducted in the Department of Pediatrics at Koppal Institute of Medical Sciences (KIMS), Koppal, Karnataka, over a one year period from August 2023 to July 2024, , and written informed consent was taken from guardians prior to enrollment.

Inclusion Criteria

- Children aged 1 to 15 years admitted to the pediatric ward or PICU with acute onset of two or more symptoms: jaundice, loss of appetite, nausea, vomiting, abdominal pain, or dark urine.
- Laboratory evidence of acute viral hepatitis defined by serum ALT >10 times the upper limit of normal and/or positive serology for HAV (IgM anti-HAV) or HBV (HBsAg, IgM anti-HBc).

Exclusion Criteria & Diagnostic Constraints

- Non-hepatotropic or secondary causes of hepatitis (malaria, dengue, enteric fever, TORCH, Wilson's disease, autoimmune hepatitis).
- Pre-existing chronic liver disease or structural hepatobiliary malformations.
- Testing for Hepatitis C (HCV) and Hepatitis E (HEV) was omitted from the study design due to lack of routine kit availability at the institution.

Patient Flow, Referral, and Follow-Up Protocols

All enrolled children underwent initial clinical assessment, routine liver function testing, manual PT/INR coagulation checks, targeted serology (IgM anti-HAV, HBsAg, IgM anti-HBc), and abdominal ultrasonography.

Patient outcomes were classified as follows:

1. **Locally Treated & Discharged:** Patients who completed treatment at KIMS Koppal until clinical and biochemical recovery.
2. **Referred to Higher Center:** Patients presenting with or developing severe Acute Liver Failure (ALF with Grade 3/4 encephalopathy, persistent severe coagulopathy INR >3.5, or refractory hypoglycaemia) who were transferred to apex super-specialty/transplant centers for advanced care.
3. **Discharged Against Medi Advice (DAMA):** Patients whose guardians requested discharge against medical advice during active hospital care.

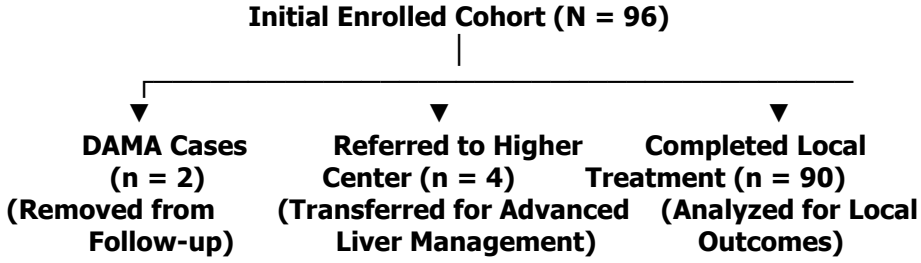
As per study design, patients in the DAMA and Referred categories were documented for enrollment characteristics but removed from final local recovery rate calculations due to incomplete local follow-up.

RESULTS

Patient Disposition and Enrollment Flow

A total of 96 children were initially enrolled in the study. During the hospital course:

- **2 cases (2.1%)** were taken DAMA by parents due to personal/social reasons and were removed from follow-up analysis.
- **4 cases (4.2%)** developed severe acute liver failure with Grade 3/4 encephalopathy and severe coagulopathy (INR >3.5) and were referred to higher super-specialty centers for advanced pediatric gastroenterology care.
- **90 cases (93.8%)** completed full inpatient treatment at KIMS Koppal and were successfully analyzed for final clinical outcomes.



Demographic Profile (Analyzed Cohort, N = 90)

Among the 90 analyzed children, the 11–15 years age group represented the largest proportion (50.0%), followed by 6–10 years (37.8%) and 1–5 years (12.2%). Male children accounted for 50 cases (55.6%) and female children 40 cases (44.4%) (Male:Female ratio 1.25:1).

Table 1: Demographic Distribution of Pediatric AVH Cases (N = 90)

Age Group (Years)	Male (n)	Female (n)	Total (%)
1 – 5	5	6	11 (12.2%)
6 – 10	20	14	34 (37.8%)
11 – 15	25	20	45 (50.0%)
Total	50 (55.6%)	40 (44.4%)	90 (100.0%)

Serological Etiology

Targeted serological evaluation among the 90 analyzed patients showed that Hepatitis A Virus (anti-HAV IgM positive) was responsible for 81 cases (90.0%), while acute Hepatitis B infection (HBsAg and anti-HBc IgM positive) accounted for 9 cases (10.0%). (Hepatitis C and Hepatitis E were not evaluated as per protocol).

Clinical Symptoms and Signs

Jaundice was present in 82 patients (91.1%), dark urine in 78 cases (86.7%), loss of appetite in 75 cases (83.3%), vomiting in 65 cases (72.2%), and fever in 60 cases (66.7%). On physical examination, icterus was noted in 82 cases (91.1%), hepatomegaly in 78 cases (86.7%), splenomegaly in 20 cases (22.2%), and ascites in 15 cases (16.7%).

Table 2: Clinical Symptoms and Signs across Age Cohorts (N = 90)

Parameter	1–5 yrs (n=11)	6–10 yrs (n=34)	11–15 yrs (n=45)	Total (N=90) (%)
Jaundice	11 (100.0%)	31 (91.2%)	40 (88.9%)	82 (91.1%)
Dark Urine	9 (81.8%)	30 (88.2%)	39 (86.7%)	78 (86.7%)
Loss of Appetite	11 (100.0%)	25 (73.5%)	39 (86.7%)	75 (83.3%)
Vomiting	8 (72.7%)	21 (61.8%)	36 (80.0%)	65 (72.2%)
Fever	6 (54.5%)	24 (70.6%)	30 (66.7%)	60 (66.7%)
Abdominal Pain	8 (72.7%)	19 (55.9%)	28 (62.2%)	55 (61.1%)
Pruritus / Itching	0 (0.0%)	6 (17.6%)	16 (35.6%)	22 (24.4%)
Icterus (Sign)	11 (100.0%)	31 (91.2%)	40 (88.9%)	82 (91.1%)
Hepatomegaly	11 (100.0%)	30 (88.2%)	37 (82.2%)	78 (86.7%)
Splenomegaly	2 (18.2%)	7 (20.6%)	11 (24.4%)	20 (22.2%)
Ascites	2 (18.2%)	5 (14.7%)	8 (17.8%)	15 (16.7%)

Laboratory Profile and Sonological Findings

Elevated transaminases and hyperbilirubinemia were present in all subjects at admission. Abdominal ultrasound showed hepatomegaly in 80 cases (88.9%), gallbladder sludge in 38 cases (42.2%), gallbladder wall thickening in 27 cases (30.0%), and ascites in 18 cases (20.0%). Normal USG findings were noted in 9 cases (10.0%).

Table 3: Baseline Laboratory Values At Admission (N = 90)

Laboratory Parameter	Observed Range	Mean / Median Value
Total Leukocyte Count (TLC)	3,200 – 18,500 /mm³	7,200 /mm³

Total Serum Bilirubin	1.3 – 24.0 mg/dL	8.1 mg/dL
Conjugated Bilirubin	0.8 – 19.5 mg/dL	5.4 mg/dL
Serum ALT (SGPT)	310 – 5,400 IU/L	1,720 IU/L
Serum AST (SGOT)	280 – 4,600 IU/L	1,350 IU/L
Alkaline Phosphatase (ALP)	230 – 1,050 IU/L	395 IU/L
Serum Albumin	2.8 – 4.5 g/dL	3.5 g/dL
Prothrombin Time (PT)	11.2 – 27.0 seconds	14.8 seconds
INR	**1.0 – 3.8**	**1.38**

Herbal Medicine Ingestion and Hospital Outcomes

Pre-hospital traditional herbal medicine intake (Naati oushadha) was documented in 61 of the 90 analyzed patients (67.8%). These children exhibited prolonged hyperbilirubinemia and delayed transaminase recovery compared to those without herbal exposure.

Among the 90 locally managed children, 6 cases (6.7%) developed mild-to-moderate ALF (Grade 1/2 encephalopathy) and were successfully managed in the PICU using IV N-acetylcysteine, fluid stabilization, bowel decontamination, and fresh frozen plasma transfusions.

Table 4: Summary of Overall Study Disposition and Clinical Outcomes

Outcome Category	Number of Cases (n)	Percentage (%)	Primary Clinical Features / Management
Completed Local Treatment & Discharged	90	93.8%	Full recovery
Referred to Higher Center	4	4.2%	Severe ALF (Grade 3/4 encephalopathy, INR >3.5, ALT >5000 IU/L); referred
Discharged Against Medical Advice (DAMA)	2	2.1%	Left hospital prior to completion of treatment; removed from follow-up
Total Enrolled Cohort	96	100.0%	—

DISCUSSION

This prospective study illustrates the real-world management and disposition of pediatric acute viral hepatitis cases presenting to a peripheral tertiary teaching hospital in North Karnataka. Consistent with published Indian literature, Hepatitis A virus (90.0% of analyzed cases) was the leading cause of AVH.

By focusing serological evaluation on HAV and HBV, this study reflects practical operational protocols in resource-limited district medical colleges. The findings confirm that basic serological testing combined with routine LFTs and PT/INR monitoring effectively identifies the majority of clinically significant pediatric AVH cases.

A vital aspect of clinical management in peripheral institutions is the prompt identification and referral of cases exceeding local therapeutic capabilities. In our study, 4 children (4.2%) presenting with rapid encephalopathy progression (Grade 3/4) and severe coagulopathy (INR >3.5) were transferred to higher centers equipped with pediatric gastroenterology subspecialties services. Timely referral prevents avoidable in-hospital mortality at peripheral centers while ensuring critically ill children receive advanced care.

The occurrence of DAMA in 2 cases (2.1%) highlights persistent socioeconomic challenges in rural healthcare, where health literacy deficits and constraints lead guardians to seek premature discharge. Furthermore, 67.8% of patients had received unstandardized herbal preparations prior to admission, which exacerbated hepatocellular stress and delayed hospital presentation.

Among the 90 patients who remained under local care, intensive supportive therapy in the PICU resulted in 100% recovery and discharge, demonstrating that peripheral tertiary centers can achieve excellent outcomes for non-transplant-stage pediatric AVH.

CONCLUSION

Hepatitis A is the primary cause of pediatric

acute viral hepatitis in rural North Karnataka. In peripheral tertiary teaching hospitals operating without extended serological panels (HCV/HEV) or liver transplant facilities, a streamlined approach utilizing basic HAV/HBV serology, liver transaminases, manual PT/INR, and ultrasound is clinically effective. Establishing clear referral criteria for high-risk ALF cases to higher centers, alongside public awareness campaigns against unstandardized herbal remedies and DAMA, is essential for optimizing pediatric viral hepatitis outcomes.

REFERENCES

1. Kliegman R, St. Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM, editors. Nelson Textbook of Pediatrics. 21st ed. Philadelphia: Elsevier; 2020:2106–2118.
2. Acharya SK, Batra Y, Bhatkal B, Ojha B, Kaur L. Seroepidemiology of hepatitis A virus infection among school children in Delhi: implications for HAV vaccination. J Gastroenterol Hepatol. 2003;18(7):822–827.
3. Sood V, Lal BB, Gupta E, Khanna R, Siloliya MK, Alam S. Hepatitis A virus-related pediatric liver disease burden and its significance in the Indian subcontinent. Indian Pediatr. 2019;56(9):741–744.
4. Thapa BR, Singh K, Singh V, Broor S, Singh V, Nain CK. Pattern of hepatitis A and hepatitis B virus markers in cases of acute sporadic hepatitis and in healthy school children from North West India. J Trop Pediatr. 1995;41(6):328–329.
5. Behera MR, Patnaik L. Clinico-biochemical profile and etiology of acute viral hepatitis in hospitalized children: a study from Eastern India. Indian J Child Health. 2016;3(4):317–320.
6. Das AK. Changing patterns of aetiology of acute sporadic viral hepatitis in India: newer insights from north-east India. Int J Curr Res Rev. 2014;6(19):32–39.
7. Girish N, Sunil B, Devaranavadagi RA. A clinical study of viral hepatitis in children: a prospective hospital-based study. Int J Contemp Pediatr. 2018;5(2):563–568.
8. Sudhamshu KC, Sharma D, Poudyal N, Basnet BK. Acute viral hepatitis in pediatric age groups. J Nepal Med Assoc. 2014;52(193):687–691.
9. Pannuti CS, Mendonça JS, Pereira ML, Carvalho MJ, Amato Neto V. Sporadic acute viral hepatitis A, B and non-A non-B: a prospective study of 150 consecutive cases in São Paulo, Brazil. Trop Geogr Med. 1985;37(2):136–138.
10. Nandi B, Hadimani P, Arunachalam R, Ganjoo RK. Spectrum of acute viral hepatitis in Southern India. Med J Armed Forces India. 2009;65(1):7–9.
11. Parekh Z, Modi R, Banker D. Clinical study of hepatitis in children with special reference to viral markers. NHL J Med Sci. 2013;2(1):23–27.
12. Behera AK, Jit BP, Purohit P, Nahak SR, Chhatar S, Marndi C, et al. Clinical profile of viral hepatitis in a tertiary health care centre of eastern India. Int J Med Res Rev. 2016;4(7):1276–1280.
13. Salahuddin M, Syed SA, Manzoor H, Mahenaz A, Farhana T. Recent spectrum of acute viral hepatitis in children: an experience in a tertiary centre of Bangladesh. Adv Res Gastroenterol Hepatol. 2017;6(3):555686.
14. Bernuau JR, Durand F. Herbal medicines in acute viral hepatitis: a ticket for more trouble. Eur J Gastroenterol Hepatol. 2008;20(3):161–163.