

A Clinical Spectrum of Hepatitis a in Children

Asha Kumari¹, N P Gupta², Shilpi Kumari³¹Post Graduate, Department of Paediatrics, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India²Professor, Department of Paediatrics, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India³Post Graduate, Department of Paediatrics, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India

Received: 09-10-2023 Revised: 25-10-2023 / Accepted: 01-11-2023

Corresponding author: Dr. Asha Kumari

Conflict of interest: Nil

Abstract

Background: Hepatitis A is infectious through feco oral route and is a contagious disease caused by a hepatovirus. The primary cause of the disease is contaminated water or food, inadequate sanitation and improper personal hygiene standards. Despite the development of hepatitis vaccine this disease spreads easily through these primary causes. This disease can be of no symptoms to fulminant hepatitis. The main aim of this study is to analyze the profile of the children affected with Hepatitis A infection.

Materials and Methods: This was a retrospective study which was conducted from a period of September 2022 to September 2023 on a total 100 children with the age group of 6 months to 12 years affected with Hepatitis A disease. This study took place in Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India.

Results: Totally 100 children with acute hepatitis A under 12 years of age were selected for this study. The average of the children's age in this study was 6 years among the 100 cases and the most repeated symptoms were fever in about 92%, gastrointestinal complications in about 59% and dullness in about 38%.

Conclusion: Hepatitis A is a self-restricting disease but because of its associated diseases, liver complications and usage of specific drugs makes this disease severe. And so thorough diagnosis is required for all the affected individuals until full recovery.

Keywords: Hepatitis A virus, Asymptomatic, Fulminant Hepatitis, Hygiene Standards.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Hepatitis A is the most prevalent disease observed among children, especially of pediatric age. This disease is caused by a hepatotropic virus called Hepatitis A virus (HAV) [1]. It is also the main factor for frequent acute viral hepatitis although the HAV virus occurs in all age groups and none has been observed to have immunity against it [2].

Acute viral hepatitis is a major health condition occurring in children globally and mainly in rural and slum regions where people with low social status live their life. This disease is also referred to as viral infection and the route of spread is through feco-oral route [3,4]. The World Health Organization (WHO) has reported that nearly 1.5 million cases per year of acute viral hepatitis have been recorded worldwide and about 80,000 to 1,00,000 people per year die in the case of acute viral hepatitis respectively [5].

In India, the prevalence of this disease is about 80% which needs to be observed in terms of proper

vaccination [6]. Hepatitis A is a self-restricting disease and gives lifetime resistance immunity, but because of its associated diseases, liver complications and usage of specific drugs makes this disease severe. The main etiology of Hepatitis A is consuming contaminated water or food, inadequate sanitation and improper personal hygiene standards. Despite the development of hepatitis vaccine this disease spreads easily through these primary causes and the range of linked conditions for Hepatitis A is still unknown [7]. It can be asymptomatic and can also be varied with a wide range of symptoms like fever, appetite, dullness, and gastrointestinal complications and so on.

Recently, atypical presentation of Hepatitis A is increasing especially in children and pediatrics, and it is also known that Hepatitis A is associated with liver diseases in pediatrics [8]. In this study, a complete analysis of the profile and clinical features of the children affected with Hepatitis A infection is investigated.

Materials and Methods

A cross sectional study was made in Darbhanga Medical College and Hospital, Bihar from a time period of September 2022 to September 2023. Children with the age group under 12 years observed with the complications like fever, dullness, jaundice, diarrhea, vomiting, abdominal pain and low appetite were included in this study. Affected individuals with the positive result of Hepatitis A virus Immunoglobulin M (IgM) were selected for further analysis. These individuals were admitted in the hospital for diagnosis and complete observation and their signs for admission were frequent dullness, low appetite, increased body temperature and vomiting.

Outpatients from the hospital were not included in this study and the affected children's parents were asked for consent for this study. Initial tests for the patients were performed like complete blood count, prothrombin duration and liver functioning tests. The level of ammonia serum tests were also taken when needed in cases of patients with elevated sensorium. Patients were taken good care with respect to their symptoms and proper diets were

followed. The usage of Antibiotics was suggested in cases of emergency. Data collection and statistical analysis were recorded using Microsoft Excel 2010.

Results

A total of 100 children with acute hepatitis A were admitted in the pediatrics department in Darbhanga Medical College and Hospital with acute hepatitis A. Affected children under 12 years of age were selected for this study and the average age of the children was 6 years in this study. Most of the selected children with acute hepatitis A were observed from the age group of 0-5 years. The number of males was higher than the number of affected females and it was noted that they had a history of consuming store bought foods. No patients had a history of vaccine immunization. Four cases were observed to have taken a nonsteroidal anti-inflammatory drug called nimesulide and eight cases had a previous medical history of dengue as an associated infection. The number of patients with gender and age groups were given in [Table 1].

Table 1: Demographic profile

Age Groups	Male	Female	Total
0-5 years	24	20	44
6-10 years	28	8	36
11-12 years	16	4	20
Total	68	32	100

The prevailing signs and symptoms in the patients were excessive serum bilirubin levels which was observed in all the patients (100%), increase in body temperature was observed in about 92% of the patients, deep yellow colored urine was observed in about 81% of the patients, diarrhea was observed in 56% of the patients, vomiting was observed in 22% of the patients, abdominal pain was observed in 59% of the patients, irritation and elevated sensorium were also observed in 44% of the patients and dullness was observed in 38 % of the patients. Many other associated symptoms were also noticed.

The highly observed physical symptoms were enlarged liver which was observed in 96% of the patients, ascites was observed in 4% of the patients

and acute liver failure was observed in 32% of the patients. These cases were managed in Intensive Care Unit (ICU) and among the 100 patients, 28 patients were regrettably dead out of which 8 patients had a previous medical history of dengue, 4 patients had a history of having taken nimesulide and the other 4 patients had liver dysfunctions. No re-admissions were observed.

About the laboratory tests, once the Hepatitis A Virus IgM test was confirmed positive other laboratory analyses were also performed such as Complete blood count, prothrombin duration, serum ammonia levels and liver functionality tests and the resulting values were recorded [Table 2].

Table 2: Laboratory parameters

Investigations	Lab parameters
Total Bilirubin	1.1 – 30.7 mg/dL
Alanine Transaminase (ALT)	256 – 3111 IU/ml
TLC	5,000 – 46,000/ μ L
Aspartate Transaminase (AST)	210 -3098 IU/ml
Ammonia	Raised in 32 patients
Conjugated Bilirubin	1.0 – 12.6 mg/dL
Albumin	1.9 – 4.3 mg/dL
Prothrombin Time	11.6 – 111 secs

Leukocytosis was observed in 64 patients which was about 64%, Total level of serum bilirubin and direct bilirubin was noticed to be increased in all patients, About 4 times increase in the levels of Alanine Transaminase was observed and decreased level of serum albumin was noted in 8 patients, 48 patients which was about 48% experienced unstable prothrombin duration of more than 12-15 seconds. For patients with altered sensorium the level of serum ammonia tests were also performed.

Among the 100 patients, 84 patients which were about 84% were cured completely, 32 cases which were about 32% had acute liver failure and regrettably 28 patients were dead. Treatments like proper diet and complete rest were recommended throughout the period and patients with acute liver failure were continued to be treated in the Paediatrics Intensive Care Unit (PICU).

Discussion

There are numerous strains of Hepatitis virus and the signs and symptoms continue to vary and so it is difficult to diagnose the disease [9]. In case of Hepatitis A it appears to be asymptomatic to acute liver failure especially in pediatrics [10, 11]. In this study among the 100 patients with Hepatitis A the most frequent symptoms were increased body temperature in about 92% of the patients and diarrhea in about 55% of the patients this may provide a chance to the pediatricians to find a hint about the disease in the children [12].

This is also similar to many other studies where increased body temperature and diarrhea were the most common symptoms [13, 14]. The main disadvantage of the disease is that even a slight delay in detecting the disease will cause jaundice and make the complications even more badly [15]. The common physical symptoms of Hepatitis A were found to be jaundice which was observed in all the affected individuals (100%) and enlarged liver which was found in about (79%) of the affected individuals. 4 patients were noticed to have developed ascites this may be due to the cause of low albumin serum levels.

The duration of the disease was observed to be prolonged in patients with high levels of serum bilirubin and it took a very long period for the patients to get back to the normal level of serum bilirubin. The elevated levels of alanine transaminase (ALT) and aspartate transaminase (AST) did not severe the condition of the patients. The average recovery time for the patients was about 2 weeks in which their biochemical profile came to normal range in which 4 patients took about 8 weeks to recover completely from the disease.

After complete recovery there is no worsening of the disease in the patients but the children had a pain in abdomen during the phase of recovery. In this study,

fulminant liver failure was noticed in about 32 patients (29%) which is the very high incidence rate in children. The death rates in this study were also regrettably high in this study and this may be due to the short duration of time and delayed admittance of the patients to the hospital.

Among the mortality rate, 4 patients were observed to have taken a banned drug nimesulide, 8 patients had a previous medical history of associated dengue and 4 patients had chronic liver diseases and hence these may be the risk factors.

Conclusion

Although Hepatitis A is a self-restricting disease but because of its associated diseases, liver complications and usage of specific drugs makes this disease severe. And so thorough diagnosis is required for all the affected individuals until full recovery. Also delayed admittance of the patients to the hospital may complicate the disease in children and increase the mortality rates.

References

1. 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 Paediatr*. 1995; 41: 328-9.
2. Koff RS. Clinical manifestations and diagnosis of hepatitis A virus infection. *Vaccine* 1992; 10(suppl 1): S 15-7.
3. Ciust ID. Clinical features. In: Gust ID, Feinstone SM. eds. *Hepatitis A*. Boca Raton, FL: CRC Press. 1988:145-62.
4. Seeff LB. Diagnosis, therapy, and prognosis of viral hepatitis. In: Zakim D, Boyer TD. eds. *Hepatology: a textbook of liver disease*. 2nd ed. Philadelphia: WB Saunders. 1990:958-1025.
5. Kamath SR, Sathiyasekaran M, Raja TE, Sudha L. Profile of viral hepatitis A in Chennai. *Indian Pediatr*. 2009 Jul;46(7):642-3.
5. Kumar A, Yachha SK, Poddar U, Singh U, Aggarwal R. Does co-infection with multiple viruses adversely influence the course and outcome of sporadic acute viral hepatitis in children? *J GastroenterolHepatol*. 2006 Oct;21(10):1533-7.
6. Squires RH Jr, Shneider BL, Bucuvalas J, et al. Acute liver failure in children: the first 348 patients in the pediatric acute liver failure study group. *J Pediatr* 2006; 148:652-8.
7. Liver Advisory Group. Liver transplan-tation: selection criteria and recipient reg-istration. Policy pol 195/7. March 2018.
8. Centres for Disease Control and Prevention. Adenovirus: clinical overview for healthcare professionals. 2019 (<https://www.cdc.gov/adenovirus/hcp/clinical-overview.html>).

9. Braccio S, Irwin A, Riordan A, et al. Acute infectious hepatitis in hospitalised children: a British Paediatric Surveillance Unit study. *Arch Dis Child* 2017; 102:624-8.
10. Baker JM, Buchfellner M, Britt W, et al. Acute hepatitis and adenovirus infection among children- Alabama, October 2021–February 2022. *MMWR Morb Mortal Wkly Rep* 2022; 71:638-40.
11. Gutierrez Sanchez LH, Shiau H, Baker JM, et al. A case series of children with acute hepatitis and human adenovirus infection. *N Engl J Med* 2022; 387:620-30.
12. Dotan M, Zion E, Bilavsky E, et al. Adenovirus can be a serious, life-threatening disease, even in previously healthy children. *Acta Paediatr* 2022; 111:614-9.
13. Alcamo AM, Wolf MS, Alessi LJ, et al. Successful use of cidofovir in an immune-competent child with severe adenoviral sepsis. *Pediatrics* 2020;145(1): e20191632.
14. European Centre for Disease Prevention and Control. Guidance for diagnostic testing of cases with severe acute hepatitis of unknown aetiology in children. May 25, 2022 (https://www.ecdc.europa.eu/sites/default/files/documents/Guidance_Testing_Hepatitis.pdf).