

Original Research

Assessment of hepatitis A infection in children

Madhu Goyal¹, Kriti Vishwakarma²

^{1,2}Assistant Professor, Department of Paediatrics, LN Medical College & Research Centre, Bhopal (M.P.), India

ABSTRACT:

Background: Hepatitis A is generally an acute, self-limiting liver infection transmitted through the faecal-oral route by a picornavirus. The present study was conducted to assess hepatitis A infection in children. **Materials & Methods:** 52 children age ranged 4-16 years of both genders of hepatitis A were subjected to laboratory findings such as hemogram, AST, ALT, bilirubin etc. **Results:** Age group 4-6 years had 8, 7-9 years had 14, 10-12 years had 20 and 13-16 years had 10 cases. Common symptoms were nausea in 25, icterus in 46, vomiting in 32, loss of appetite in 48, diarrhoea in 13, dark urine in 50 and epistaxis in 6 cases. The difference was significant ($P < 0.05$). The mean Na level was 135.2 mEq/L, K level was 3.81mEq/L, BUN was 25.4 mg/dl, AST was 1012.6 U/L, ALT was 1780.4 U/L, ALP was 836.2 U/L and total bilirubin level was 5.3 mg/dl. **Conclusion:** Laboratories findings such as ALT and AST are helpful to diagnose the cases of hepatitis in children.

Key words: Hepatitis, ALT, AST.

Received: 14, February 2021

Accepted: 18 March, 2021

Corresponding Author: Dr. Kriti Vishwakarma, Assistant Professor, Department of Paediatrics, LN Medical College & Research Centre, Bhopal (M.P.), India

This article may be cited as: Goyal A, Vishwakarma K. Assessment of hepatitis A infection in children. J Adv Med Dent Scie Res 2021;9(4):28-31.

INTRODUCTION

Hepatitis A is generally an acute, self-limiting liver infection transmitted through the faecal-oral route by a picornavirus, the hepatitis A virus (HAV), which causes 10 million infections worldwide each year.¹ The clinical spectrum ranges from mostly asymptomatic infection to rarely fulminant hepatitis and age is the major factor that influences the clinical course of the primary HAV infection; it is symptomatic in only 4%–16% of children compared to 75%–95% of adults. The degree of endemicity is closely related to the prevailing hygiene and sanitary conditions, socio-economic level, vaccination, and other development indicators.²

The mechanisms underlying synthesis of HAV RNA have not been intensively investigated, but are thought to be similar to those of other, well studied picornaviruses. RNA replication proceeds slowly, and like all positive-strand RNA viruses, within the cytoplasm and in close association with membranes.³ Hepatitis A is an ancient disease that has likely afflicted mankind since humans first began to live in groups large enough to sustain transmission of the causative agent, hepatitis A virus (HAV). In

reviewing what was known as ‘catarrhal jaundice’ in 1912, Cockayne noted descriptions of epidemic jaundice extending back to antiquity.⁴ The infectious nature of the disease was proven several decades later in deliberate human transmission studies. Such experiments led to a clear distinction between hepatitis A (‘infectious hepatitis’) and hepatitis B (‘homologous serum jaundice’) and recognition of the lack of cross immunity between these two forms of transmissible hepatitis by as early as 1945.⁵ The present study was conducted to assess hepatitis A infection in children.

MATERIALS & METHODS

The present study comprised of 52 children age ranged 4-16 years of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. A thorough clinical examination was performed in all. Symptoms were recorded. Laboratory findings such as hemogram, AST, ALT, bilirubin etc. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Age group (Years)	Number	P value
4-6	8	0.02
7-9	14	
10-12	20	
13-16	10	

Table I shows that age group 4-6 years had 8, 7-9 years had 14, 10-12 years had 20 and 13-16 years had 10 cases. The difference was significant (P< 0.05).

Graph I Distribution of patients

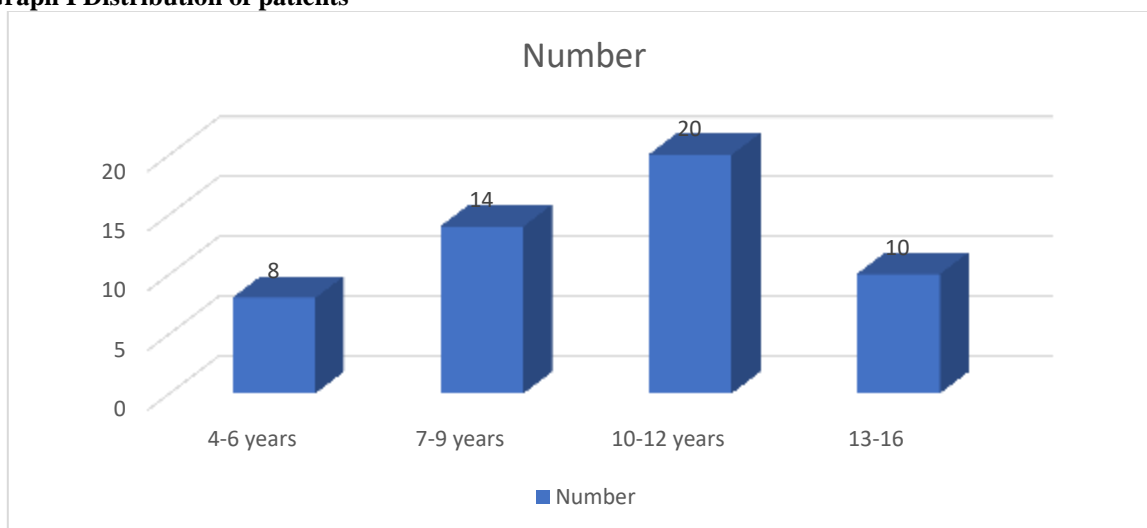


Table II Assessment of symptoms in patients

Symptoms	Number	P value
Nausea	25	0.05
Icterus	46	
Vomiting	32	
Loss of appetite	48	
Diarrhoea	13	
Dark urine	50	
Epistaxis	6	

Table II, graph II shows that common symptoms were nausea in 25, icterus in 46, vomiting in 32, loss of appetite in 48, diarrhoea in 13, dark urine in 50 and epistaxis in 6 cases. The difference was significant (P< 0.05).

Graph II Assessment of symptoms in patients

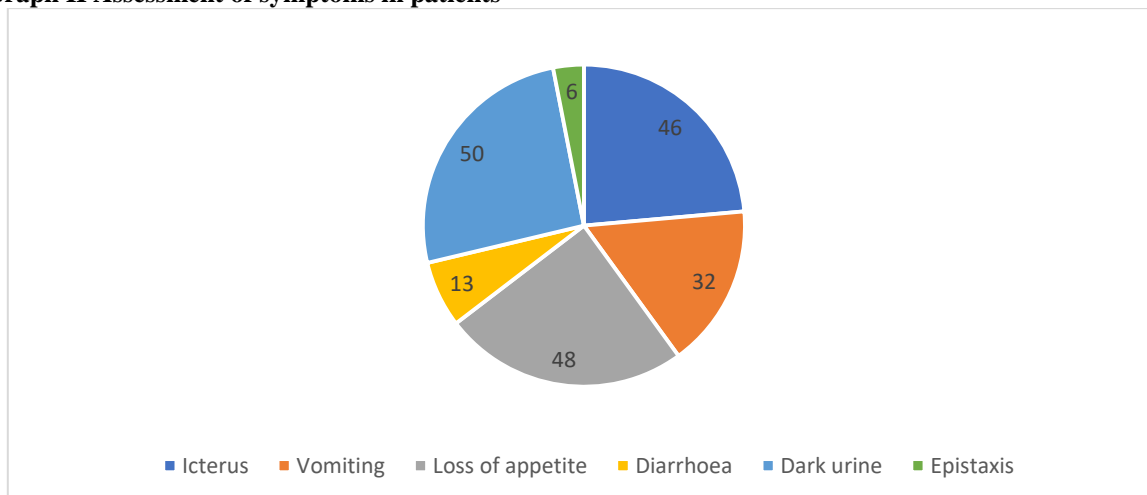


Table III Laboratories findings in patients

Findings	Number	SD
Na (mEq/L)	135.2	20.4
K (mEq/L)	3.81	1.4
BUN (mg/dl)	25.4	4.9
AST (U/L)	1012.6	320.5
ALT (U/L)	1780.4	250.6
ALP (U/L)	836.2	112.4
Total bilirubin (mg/dl)	5.3	1.2

Table III shows that mean Na level was 135.2 mEq/L, K level was 3.81mEq/L, BUN was 25.4 mg/dl, AST was 1012.6 U/L, ALT was 1780.4 U/L, ALP was 836.2 U/L and total bilirubin level was 5.3 mg/dl.

DISCUSSION

HAV infection is common throughout the developing world, where infections most frequently are acquired during early childhood.⁶ In developed countries, HAV infection is less common. Hepatitis A virus (HAV) infection is one of the most common causes of acute hepatitis worldwide. Approximately 1.5 million clinical cases occur worldwide annually, but the rate of infection is probably 10 times higher.⁷ Hepatitis A virus is a positive-sense, single-stranded RNA virus classified within the genus Hepatovirus of the family Picornaviridae. The chief mode of transmission for HAV is through the faecal oral route, including person to-person spread, and contaminated water or food products, but it has also been associated with outbreaks in injecting drug users and men who have sex with men.⁸ The present study was conducted to assess hepatitis A infection in children.

We found that age group 4-6 years had 8, 7-9 years had 14, 10-12 years had 20 and 13-16 years had 10 cases. Bhat et al⁹ found that out of 126 patients, males were 86 and females were 40. Common clinical features in patient was nausea/ vomiting in 104, jaundice in 87 and abdominal pain in 110 patients. The mean AST level in patients was 3765.4 IU/L, ALT was 2672.8 IU/L, ALP was 251.9 IU/L, GGT was 280.1 IU/L, total bilirubin was 19.2 mg/dl and serum creatinine was 2.3 mg/dl.

We found that common symptoms were nausea in 25, icterus in 46, vomiting in 32, loss of appetite in 48, diarrhoea in 13, dark urine in 50 and epistaxis in 6 cases. Cetinkaya et al¹⁰ found that of 427 patients, 49.4% were female and 50.6% were male. Hospitalization rate of the patients was 28.3%. The reason for hospitalization was vomiting in 58.7% of the patients and abdominal pain in 28%. The mean time of hospitalization was 5.2 ± 4.5 (1–40) days. There was no significant difference in hospitalization time by age. Vomiting and abdominal pain were significantly more common, and PT and aPTT levels were significantly elevated in patients with elevated AST and ALT levels over 1000 IU/L. PT elevation was present in 15.2% of the patients, aPTT elevation in 11.9%, leukopenia in 16.6%, and thrombocytopenia in 2.6%. In terms of atypical course, four patients (0.9%) had cholestatic hepatitis, one had recurrent

hepatitis, and one had fulminant hepatitis, yet no mortality was observed.

We found that mean Na level was 135.2 mEq/L, K level was 3.81mEq/L, BUN was 25.4 mg/dl, AST was 1012.6 U/L, ALT was 1780.4 U/L, ALP was 836.2 U/L and total bilirubin level was 5.3 mg/dl. Kalyonku et al¹¹ evaluated atypical manifestations of hepatitis A infection in children. Twenty-one subjects had atypical manifestations of disease as follows immune thrombocytopenic purpura, pleural effusion, autoimmune hepatitis and hemolytic anemia, nephrotic syndrome, meningoencephalitis, autoimmune hepatitis, acalculous cholecystitis, relapsing hepatitis and fulminant hepatitis. Only gender was significantly different, with males having more atypical manifestations than females (P=0.03). Mortality rate was 3% (3 patients with fulminant hepatitis and 1 with meningoencephalitis died in the intensive care unit).

Chen et al¹² conducted this study to identify the relevant presenting symptoms and laboratory findings of AHA in children. There were 29 pediatric patients admitted with the diagnosis of AHA, including 16 male patients and 13 female patients. Poor appetite, malaise, abdominal pain, vomiting and fever were the leading constitutional symptoms. Jaundice and tea-colored urine were the most relevant hepatobiliary presentations. Elevation of aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, direct and indirect bilirubin was common, although other hematology and biochemistry examinations were within normal limits on most occasions. There was no mortality in our series. A slightly increasing prevalence of AHA was noted over the two decades of the study period, although it was not statistically significant.

CONCLUSION

Authors found that laboratories findings such as ALT and AST are helpful to diagnose the cases of hepatitis in children.

REFERENCES

1. Cockayne. The Global Prevalence of Hepatitis A Virus Infection and Susceptibility: A Systematic Review *Infection* 1989; 10: 200-210.

2. Widell A, Hansson BG, Moestrup T, et al. Increased occurrence of hepatitis A with cyclic outbreaks among drug addicts in a Swedish community. *Infection* 1983; 11: 198-200.
3. Butot S, Putallaz T, Sánchez G. Effects of sanitation, freezing and frozen storage on enteric viruses in berries and herbs. *Int J Food Microbiol* 2008; 126: 30-35.
4. Lednar WM, Lemon SM, Kirkpatrick JW, et al. Frequency of illness associated with epidemic hepatitis A virus infections in adults. *Am J Epidemiol* 1985; 122: 226-233.
5. Stene-Johansen K, Jenum PA, Hoel T, et al. An outbreak of hepatitis A among homosexuals linked to a family outbreak. *Epidemiol Infect* 2002; 129: 113-117.
6. Tjon GM, Gotz H, Koek AG, et al. An outbreak of hepatitis A among homeless drug users in Rotterdam, The Netherlands. *J Med Virol* 2005; 77: 360-366.
7. Jenson HB. The changing picture of hepatitis A in the United States. *Curr Opin Pediatr* 2004; 16: 89- 93.
8. Janaszek-Seydlita W, Bucholc B, Wiatrzyk A. Prevalence of anti-HAV antibodies in Warsaw population. *Przegl Epidemiol* 2007; 61: 675-682.
9. Bhat AH. To determine Hepatitis A virus infection among hospitalized patients. *J Adv Med Dent Scie Res* 2014;2(3):268-271.
10. Çetinkaya B, Tezer H, Parlakay AÖ, Sayli TR. Evaluation of pediatric patients with hepatitis A. *The Journal of Infection in Developing Countries*. 2014 Mar 13;8(03):326-30.
11. Kalyoncu D, Urganci N, Gulec SG. Hepatitis A in children: evaluation of atypical manifestations. *Paediatrica Indonesiana*. 2020 Aug 3;60(5):239-43.
12. Chen YC, Huang LT, Wang SM, Tiao MM, Liu JW. Acute hepatitis A infection in children: a 20-year experience of a medical center in Southern Taiwan. *Acta Paediatrica Taiwanica Taiwan er ke yi xue hui za zhi*. 2007 May 1;48(3):131-4.