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Original Research Article

Study of clinical profile and outcome of viral hepatitis in children with reference to liver function test during covid pandemic admitted at tertiary care hospital

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ABSTRACT

Background: Viral hepatitis is major health problem in both developing and developed country affecting millions of children worldwide. Viral hepatitis defined as inflammation of liver due to hepatotropic and/or non-hepatotropic viruses. Extent of disease vary from acute to chronic which ranges from asymptomatic to fatal acute and on other side from subclinical persistent to rapid progressive chronic disease. Aim of study was proportion and etiology with clinical profile and outcome relation to liver function test (LFT).
Methods: This is retrospective observation study done at civil hospital, Ahmedabad during June 2019 to May 2021 during covid era in admitted patients from age of 6 month to 12 year diagnosed as viral hepatitis. Data collected from medical records and investigation from laboratory data.
Results: In my study, Viral hepatitis was m/c seen in age group of 5 to 10 year in lower socioeconomic class with most common hepatotropic virus was hepatitis A (51.79%) and non-hepatotropic virus was dengue virus (17.86%). Most common presenting complain was fever (93.75%) and sign was jaundice (87.5%). Altered liver function seen in 96.57% patients. Outcome with 4.46% death due to covid19 virus.
Conclusions: In my study during covid19 pandemic, still most common cause for viral hepatitis was hepatotropic virus–HEPATITIS A in admitted patients at tertiary care hospital. But case fatality rate was noted highest in COVID-19 virus among total death.

Keywords: COVID-19, LFT, Viral hepatitis

INTRODUCTION

Viral hepatitis is major health problem in both developing and developed country affecting millions of children worldwide. Viral hepatitis defined as inflammation of liver due to hepatotropic virus and/or non-hepatotropic viral infection. Extent of viral infection vary from acute to chronic liver disease which ranges from asymptomatic and inapparent to fulminant and fatal acute infection and on the other hand from the subclinical persistent infection to rapidly progressive chronic liver disease with cirrhosis and even hepatocellular carcinoma, especially common blood born type of viral hepatitis.[2] The study was selected as HAV and HEV are an important cause of acute viral hepatitis and acute liver failure in children in India. Available literature indicates a wide range and suggests that HAV is responsible for 10-30% of acute hepatitis and 5-15% of acute liver failure cases in India. It is

further reported that HEV 10-40% of acute hepatitis and 15-45% of acute liver failure. India also has "intermediate to high endemicity" for hepatitis B surface antigen with highest prevalence recorded in native of Andaman and Arunachal Pradesh.[3] Hepatitis B surface antigen (HBsAg) positivity in the general population ranges from 1.1% to 12.2%, with an average prevalence of 3-4%. Anti-Hepatitis C virus (HCV) antibody prevalence in the general population is estimated to be between 0.09-15%.

It is estimated that there are 40 million people chronically infected with Hepatitis B Virus (HBV) and based on some regional level studies, it is estimated that there are 6-12 million people with Hepatitis C in India. Chronic HBV infection accounts for 40-50% of HCC and 20-30% cases of cirrhosis in India. Chronic HCV infection accounts for 12-32% of hepatocellular carcinoma (HCC) and 12-20% of cirrhosis.[3] Other non-hepatotropic virus like Epstein-Barr virus, Cytomegalovirus are present acute hepatitis. Herpes Simples Virus and Enterovirus can cause acute hepatitis and even acute liver failure in newborn period.[4] In India, Dengue virus infection is known to cause acute hepatitis with elevated liver enzymes. As dengue has become more or less endemic in West India especially Gujarat, it should be considered as one of the possible diagnoses for acute hepatitis. In severe COVID-19, In some of cases also cause hepatitis in form of multisystem inflammatory syndrome in children (MISC) or COVID-19 associated hepatitis in children (CAH-C). Study of proportion, etiology and clinical profile of viral hepatitis in relation to liver function test and outcome of viral hepatitis.

METHODS

Study design

This was retrospective analytic study done at civil hospital Ahmedabad, Gujarat in June 2019 to May 2021.

Inclusion criteria

Patients included in the study by all patients who fall in age group of 6 month to 12 Year, admitted in hospital in paediatric ward during my study period with diagnosed by confirmed laboratory viral marker reports with altered liver function tests.

Exclusion criteria

Study excludes the patients treated on OPD based and age above 12 year and below 6 month and hepatis other than viral cause.

Data collection

Data collected by detailed history and general and systemic examination. Viral marker and Liver function test done in all patients and other relevant investigation done for diagnosis and management. Outcome noted in last by discharged, Lama or death of patients.

Statistical analysis

Software use for analytic data was Microsoft excel. Data analysis done by Epi-Info. All patients investigated for common hepatotropic and non-hepatotropic virus. All patients were treated according to etiology, as per standard guideline and supportive care.

RESULTS

During my study period 27225, total admitted patient in paediatrics ward whom age was in between 6 months to 12 years out of only 0.441 % patients was diagnosed as viral hepatitis.

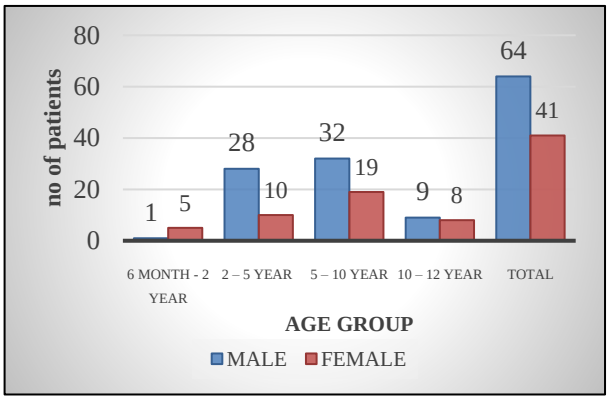

Figure 1: Age and gender distribution of patients.

In our study done during covid pandemic era, 10.71% cases were noted as covid19 hepatitis. Amongst the hepatotropic virus hepatitis A was the most common (51.79%) etiological agent whereas amongst the non-hepatotropic virus, Dengue virus was the commonest (17.86%) agent. In my study most cases were noted in age group of 5 to 10 years as behaviour of outside eating at school age. In the study, lower socioeconomic class children were most affected due poor hygiene status in this class. The most frequent presenting complain was fever (93.75%). Yellow discoloration of urine, eye and skin (82.14%), decrease appetite (80.36%) and abdominal pain (75.89%) were also relatively common symptoms. Most common sign seen in patient was jaundice followed by tender hepatomegaly in my study. Jaundice was present in 87.5%. Hepatomegaly was the most consistent (75.89%) sign in systemic examination. Splenomegaly and ascites were also present in 7.14% and 16.07% respectively. Thalassemia major was most common comorbid condition detected in 5.36%, as the repeated blood transfusion in these children may lead to increase chance to acquire transfusion related viral hepatitis. Underlying chronic liver disease was also present in 2 children. Altered PT INR ratio was present in 20.53% of children. Hypoalbuminemia was detected in 36.61%. Increased serum levels of bilirubin were observed in

90.18%. Ascites (41.17%) and altered hepatic echotexture (8.82%) were detected in routine USG.

Table 1: Percentage distribution of patients with Etiology virus.

Viral hepatitis	No. of patients	%
Hepatitis-A	58	51.79
Hepatitis-E	9	8.04
Co infection with A and E	3	2.68
Hepatitis-B	1	0.90
Hepatitis-C	6	5.36
Dengue	20	17.86
Covid 19	12	10.71
Ebv	1	0.90
Chickenguniya	1	0.90
Cytomegalovirus	1	0.90
Total	112	100

Table 2: Demographic profile of patients.

Socioeconomic class	No. of patients	%
Upper	10	8.93
Upper middle	18	16.07
Lower middle	24	21.43
Upper lower	46	41.07
Lower	14	12.5

Table 3: Symptoms.

Symptoms	No. of patients	%
Fever	105	93.75
Yellow discoloration of urine	92	82.14
Yellow discoloration of eye and skin	92	82.14
Decrease appetite	90	80.36
Abdominal pain	85	75.89
Vomiting	60	53.57
Nausea	60	53.57
Itching	25	22.32
Rashes	21	18.75
Diarrhoea	20	17.86
Convulsion	2	1.79

Table 4: Signs.

Sign	Number of patients	%
Jaundice	98	87.5
Pallor	24	21.43
Oedema	2	1.79
Hepatomegaly	85	75.89
Splenomegaly	8	7.14
Hepatosplenomegaly	12	10.71
Ascites	18	16.07
Altered sensorium	2	1.79

Table 5: Associated co morbid conditions.

Co morbid condition	No. of patients	%
Thalasemia	6	5.36
Severe nutrional anemia	4	3.57
Wilson disease	1	0.89
Undiagnosed CLD	1	0.89

Table 6: Liver function test parameter.

Lab finding	IU/L	Total patients		%
		Number	(%)	
SGPT	5–45	4	3.57	12.5
	45–500	55	49.11	30.35
	500–1000	29	25.89	42.85
	>1000	24	21.43	21.42
SGOT	5–37	4	3.57	12.5
	37–500	62	55.36	42.85
	500–1000	27	24.11	41.07
	>1000	19	16.96	12.5
ALP	<460	85	75.89	69.64
	>460	27	24.11	26.79
Serum protein	<6 gm/dl	84	75	
Serum albumin	<3.2 gm/dl	41	36.61	8.93
	>3.2 gm/dl	71	63.39	91.07
PT INR	<1.5	89	79.46	73.21
	>1.5–2.5	15	13.39	17.86
	>2.5	8	7.14	8.93
Serum bilirubin	<1.2 mg/dl	11	9.82	0
	1.2–5 mg/dl	41	36.60	25
	5-10 mg/dl	38	33.93	35.71
	>10 mg/dl	22	19.64	37.5

Table 7: Treatment modality used in patients.

Treatment		Total	%
Supportive care		99	88.39
Hepatic drip		54	48.21
Syrup lactulose		71	63.39
Oxygen support	Ventilator care	5	4.46
	HFNC	9	8.04
	Simple o2 support	18	16.07
Blood product	FFP	15	13.39
	PRC	10	8.93
	PCV	13	11.60
Tab rifaximin		11	9.82
N acetyl cysteine infusion		2	1.79
Antibiotic		51	45.54
Antiviral drug	Tab Valgancyclovir	1	0.89
	Inj Ramdesivir	5	4.46

Table 8: Outcome of patients.

Outcome	No. of patients	%
Discharged	105	93.75
Dama	1	0.09
Death	5	4.46
Absconded	1	0.09

Table 9: Viral etiology in expired cases.

Etiology	No. of patients	%
Dengue	1	20
COVID-19	4	80
Total	5	100

Portal Doppler examination was normal amongst 2 children with underlying chronic liver disease. 28.57% children required oxygen support in ICU. 33.92% of patients received various blood component therapy. Liver support treatment (hepatic drip) was given to 48.21% of children.

Antiviral drugs like Remdesivir and Valganciclovir were given to COVID-19 and CMV hepatitis patients (for chronic CMV hepatitis.[1,5]

Out of 112 patients, 5 patients have fatal outcome, in which most cases were COVID-19 virus. Amongst all hepatitis children, 5 expired. Disease specific mortality was highest in COVID-19 infection following multiorgan dysfunction.

DISCUSSION

Aetiology of viral hepatitis depend on various factor as geographical, socioeconomic etc. In our study m/c aetiology was hepatitis A virus. In Girish N et al, study at KIMS hospital Bangalore showed highest incidence of HAV (83.3%) in children, also Dr Sumit Dasa et al, study (7) at southern assam also noted highest case HAV (73.21%). Despite covid era Hepatitis A virus was still commonest cause of viral hepatitis in my study.[6]

Male: Female ratio was 1.67:1 which could be due to greater priority for male children to seek healthcare facility during sickness in the community. In the study, 5-10 year was the most common age group affected due to hepatitis (45.54%). This may be related to their increase in outdoor eating behaviour either at school or at play areas. The study Bahera et al, done in eastern India also reported maximum number of cases in age group of 5 to 10 year (50%).[8] As m/c aetiology was HAV which spread by faeco-oral route and due poor sanitation, most of our patients belonged to lower socioeconomic class (53.57%). Sumit et al, study also noted highest cases in lower socioeconomic class children (62.49%).[7]

Most of the patient present with fever (93.75%) followed by jaundice (87.5%) in my study. Hepatomegaly seen in 75.89% patients. But Sharma et al, study noted that most patient presented with jaundice (90.9%) where fever noted in only 68.2% patients and hepatomegaly seen in 90% cases. Whereas Biradar et al, study noted most cases present with vomiting and anorexia (98%).[9,10] In the study most death occur due to COVID-19 viral aetiology (4 cases) following multiorgan dysfunction syndrome. Case fatality rate noted was 33.33% in my study. Whereas in study of Rawat et al, noted only 3 cases expiry out of 37 cases of CAH-C admitted suggest 8.1 %.[11]

The exact incidence of viral hepatitis in present study cannot be commented due to exclusion of outdoor patients, treated at other health facility and community patient who not consulted at any facility. Although among the total admitted children (27225), viral hepatitis contributed to 0.411% of all cases. As our study is retrospective so cannot access patients on follow up and long-term outcome is not commented by this study.

Also, there is limitation for HDV and other rare viral aetiology which are not be evaluated as limited laboratory availability at our facility, so that cases may be missed during study.

CONCLUSION

In my study during covid19 pandemic, still most common cause for viral hepatitis was hepatotropic virus Hepatitis A (51.79%) in admitted patients at tertiary care hospital. But case fatality rate was noted highest in COVID-19 virus (80%) among total death.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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