FREQUENCY OF HEPATOTROPHS (A, B & C VIRUSES) IN HEPATIC ENCEPHALOPATHY AND THEIR OUTCOME IN CHILDREN

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ABSTRACT

OBJECTIVE:
The study was aimed to determine the frequency of hepatotrophs (A, B & C) in hepatic encephalopathy and their outcomes in indoor patients in pediatrics population at tertiary care children hospital.
BACKGROUND: Hepatitis, a general term referring to inflammation of the liver, may result from various causes, both infectious (i.e. viral, bacterial, fungal, and parasitic organisms) and noninfectious (e.g. alcohol, drugs, autoimmune diseases, and metabolic diseases); Viral hepatitis has emerged as a major public health issue and posed enormous burden over health systems in Pakistan.
MATERIALS AND METHODS: A cross sectional study was carried out at Pediatric ward of Children Hospital, Shaheed Mohtarma Benazir Bhutto Medical University, Larkana from May 2017 to November 2017. Using a non-probability consecutive sampling method, 116 patients aged 1-15 years were included in the study. Continuous variables like age, duration of illness, height and weight were calculated as mean and standard variation. The data was analyzed on SPSS version 23.
RESULTS: In the present study, the mean age was 6.20±3.57 years, mean duration of illness was 9.86±4.15 days. It was observed that 19% had jaundice, 83.6% subjects had fever, and 33.6% patients expired within 3 days. Most of the patients (49.1%) were found with grade II hepatic encephalopathy. The chi square association showed that there was a significant association of hepatitis viruses with hepatic encephalitis.
CONCLUSION: The results of our investigation showed that Hepatitis virus B was more prevalent than Hepatitis virus A and Hepatitis virus C. Poor outcomes, such as mortality, are related with gender, age, BMI, and grades of hepatic encephalopathy. Given that viral hepatitis was the most prevalent etiological agent, it is important to note that straightforward measures, such as bettering sanitary practices and immunization coverage, can significantly reduce the poor outcome.
KEYWORDS: Hepatotrophs (A, B & C), Hepatic Encephalopathy, Pediatrics

INTRODUCTION

Hepatitis, a general term referring to inflammation of the liver, may result from various causes, both infectious (i.e. viral, bacterial, fungal, and parasitic organisms) and noninfectious (e.g. alcohol, drugs, autoimmune diseases, and metabolic diseases); Viral hepatitis has emerged as a major public health issue and posed enormous burden over health systems in Pakistan.[1]

At present, six distinct types of hepatic virus have been identified and called hepatitis A, B, C, D, E & G. Hepatitis A infection is the most common prevalent of the 6 viruses. Although Hepatitis B virus is frequently spread by infected syringes, improper sterilization of surgical and medical consumables, needle stick injuries, prenatal exposure and unprotected sex.[2,3]

Globally, there are an estimated 1.4 million cases of hepatitis A every year.[4] Acute viral hepatitis A is a common infection among children in Pakistan and accounts for 50-60% of all cases of acute viral hepatitis in children. Almost 96% of the population is exposed to HAV by the age of 5 years and 98-100% at adulthood.[5-7] HAV infection occurs throughout the world but is most prevalent in developing countries. Hepatitis A is thought to account for 50% of all clinically apparent acute viral hepatitis in united states.[8,9]

The prevalence of hepatitis B (4-5%) and hepatitis C (3-7%) is high in Pakistan and both these combined are affecting almost 10% of the population. Nationwide efforts are required to identify people who may have been infected with HBV and HCV. Facility-base data have shown higher prevalence of viral hepatitis in Pakistan.[8-13]

Mortality in hepatic patients due to hepatic encephalopathy is depend on the facilities available in the hospital and the grade of hepatic encephalopathy in which patient is presented. The mortality due to hepatic encephalopathy caused by viruses is 40-50% and it depends on grades of encephalopathy. Patient in grades 3 or 4 have poor prognosis. The risk increases with other complications of hepatic encephalopathy.[14]

Viral hepatitis is a major public health problem in Pakistan and other developing nations having inadequate sanitary conditions as well as improper screening of blood transfusions. This study evaluated the frequency of hepatotrophic viruses among individuals presenting in hepatic encephalopathy in children hospital as indoor patients so that appropriate management of cases as well as preventive strategies for this could be planned.

MATERIAL & METHODS

A cross sectional study was carried out at Pediatric ward of Children Hospital, Shaheed Mohtarma Benazir Bhutto Medical University, Larkana From May 2017 to November 2017.

Using a non-probability consecutive sampling method, 116 patients aged 1-15 years were included in the study. Blood samples and clinical information were collected from cases of AVH over a 6 month's period after approval of synopsis. Samples were tested for hepatitis B surface antigen (HBsAg), anti-HCV and for anti-HAV immunoglobulin M (IgM). The data was analyzed on SPSS version 23. Continuous variables like age, duration of illness, height and weight were calculated as mean and standard variation. Frequencies and percentages were calculated for categorical variables like gender, hepatic encephalopathy grades, residence, socio-economic status (defined in proforma), clinical presentation of hepatotrophs (A, B, C) and outcome (death / discharged).

RESULTS

Total 116 children of either gender having hepatic encephalopathy with age 1 year to 15 years meeting inclusion criteria of study were

evaluated to determine the frequency of hepatotrophs (A, B & C) in hepatic encephalopathy and their outcomes.

In the present study, the mean age was 6.20±3.57 years., mean duration of illness was 9.86±4.15 days, mean weight and height was 20.62±9.03 kg and 113.15±22.46 cm respectively while mean BMI was 17.44±4.22 kg/m^2. Table I

Table I Descriptive Statistics in the Study

Statistics	Min	Max	Mean	SD	Range
Age (years)	1	15	6.2	3.57	14
Weight (Kg)	9	52	20.62	9.03	43
Height (cm)	74.2	160.2	113.15	22.46	86
BMI (Kg/m2)	10.2	32	17.44	4.22	22.3
Duration of illness (Days)	3	17	9.86	4.15	14

Out of 116 children, 62.1% were male and 37.9% were female. Most of the children (59.5%) belonged to urban areas, while 29.3% subjects belonged to lower socioeconomic class,. It was also observed that 19% had jaundice, 83.6% subjects had fever, and 50.9% were unconsciousness, and 33.6% patients expired within 3 days. Table II

Table II Socio-demographics and Patients' Status

Variables	Frequency	%
Gender		
Male	72	62.1
Female	44	37.9
Residence		
Urban	69	59.50%
Rural	47	40.50%
Socio Economic Status		
Lower Class	34	29.30%
Middle Class	55	23.30%
Upper Class	27	47.40%
Jaundice		
Yes	22	19%
No	94	81%
Fever		
Yes	97	83.60%
No	19	16.40%
Unconsciousness		
Yes	59	50.9
No	57	49.1
Outcome (Within 3 days)		
Death	39	33.60%
Discharge	77	66.40%

Most of the patients(49.1%) were found with grade II hepatic encephalopathy. While the proportion of hepatitis B was highest. Followed by hepatitis A (43.1%). Table III

Table. III Patient Distribution according to Hepatitis and Hepatic Encephalopathy Grades

Variable	Frequency	%
Hepatitis		
Hepatitis A	50	43.10%
Hepatitis B	57	49.10%
Hepatitis C	9	7.80%
Hepatic Encephalopathy		
Grade-I	14	12.10%
Grade-II	57	49.10%
Grade-III	25	21.60%
Grade-IV	20	17.20%

Total	116	100.00%

The chi square association showed that there is significant association of hepatitis viruses with hepatic encephalitis. It was observed that the hepatitis B virus was the most common among al the variants. Table IV

Table IV. Chi Square Association of Hepatic Encephalitis with Hepatitis

	Yes		No		p-value
Grade-I					
Hep A	9	64.30%	5	35.70%	0.03
Hep B	5	35.70%	9	64.30%	
Hep C	0	0.00%	14	100%	
Grade-II					
Hep A	29	50.90%	28	49.10%	0.01
Hep B	28	49.10%	29	50.90%	
Hep C	0	0.00%	57	100%	
Grade-III					
Hep A	7	28%	18	72%	0.002
Hep B	13	52%	12	48%	
Hep C	5	20%	20	80%	
Grade-IV					
Hep A	5	25.00%	15	75.00%	0.001
Hep B	11	55.00%	9	45.00%	
Hep C	4	20.00%	16	80%	

DISCUSSION

The purpose of this study was to ascertain the prevalence of hepatotrophs (A, B, and C) in hepatic encephalopathy and their outcomes in pediatric indoor patients. According to a study, children are more likely than adults to contract the hepatitis A virus because of its high frequency and low socioeconomic status. By the age of fourteen, nearly all people in the developing world have been exposed to HAV [13,15]. Hepatitis B predominated in our sample at 49.1%, followed by hepatitis A at 43.1%.

Metabolic and drug-induced hepatitis are the two main non-viral causes. According to a study, patients' mortality rate was 60%, which is high compared to liver transplantation centres that do not do this procedure[15]. In a research by Bandre et al [18]., mortality was 39%; in a study by Poddar et al., mortality was 25% [12]. According to Squires et al [17] mortality was found to be 20.8% among 235 children who did not receive a transplant as opposed to 7% among 113 children who did. The majority of patients presented with grade III or IV encephalopathy, which increased mortality [15] In our study, mortality was 33.6%, with grade II and grade II seeing the highest deaths.

Studies have shown that a variety of factors, such as age, the degree of encephalopathy, the severity of the coagulopathy, and the results of liver function tests like the serum bilirubin and SGPT, can affect a patient's prognosis. The mortality rate was highest among children under the age of 4 years [15]. Another study, Squires et al. [17], found increased mortality among children under the age of three. Other studies also found higher mortality in the younger age group. According to Poddar et al.[12], the average age of patients who passed away was 4.4± 2.9 years, while the average age of patients who recovered was 6.2 ±3 years. In our study, patients who did not survive had a mean age of 4.02 ±2.69 years, and it was shown that mortality was higher in patients under the age of 5 than in patients over the age of 5 years.

Hepatic encephalopathy grade continues to be a key indicator of prognosis. Due to the fact that grade III and grade IV are frequently accompanied by cerebral oedema, their outcomes are miserable [15]. In other studies, higher grade encephalopathy was associated

with higher mortality rates. For example, Bandre et al.[18] found that only 2 out of 22 patients with grade I and II encephalopathy died, compared to 12 out of 14 children with grade III and grade IV encephalopathy. According to Poddar et al.[12], all patients with grades I or II and 19 (53%) patients with grades III or IV recovered, whereas 17 (47%) patients with grades III or IV passed away. According to Squires et al. [17], only 25% of grade III or IV patients experienced a spontaneous recovery. In our study, grade II had the highest percentage of students (49.1%), followed by grades III (21.6%), IV (17.2%), and I (12.1%).

HE is still a significant predictor of prognosis, according to research conducted in the years following liver transplantation. Only 25% of babies with a peak HE in grades 3–4 in one research saw a spontaneous recovery[16-19].

LIMITATION OF THE STUDY

This study's applications might stand constrained because of the sample size. The present study's primary drawbacks are its single-center experience and nonrandomized study methodology. Because of the limited sample size and urban setting of the study, it is possible that the findings cannot be applied to bigger populations.

CONCLUSION

The results of our investigation showed that Hepatitis virus B was more prevalent than Hepatitis virus A and Hepatitis virus C. Poor outcomes, such as mortality, are related with gender, age, BMI, and grades of hepatic encephalopathy. Since we lack artificial liver support techniques and hepatic transplantation facilities, the death rate is substantial. If these facilities are made available in our nation, it will get better. Given that viral hepatitis was the most prevalent etiological agent, it is important to note that straightforward measures, such as bettering sanitary practices and immunization coverage, can significantly reduce the poor outcome.

AUTHORS' CONTRIBUTION

AZ Khoso and K Aijaz collected the data, Mansoor P and MP Shahani entered and analyzed the data, Washdev T, Irfan A and Munawar A drafted the manuscript.

COMPETING INTERESTS

Authors declared no any competing interests.

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