ASSESSMENT OF CASES OF ACUTE VIRAL HEPATITIS IN CORRELATION WITH LIVER PROFILE

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ABSTRACT

BACKGROUND

Typical symptoms of acute hepatitis are fatigue, anorexia, nausea, and vomiting. Very high aminotransferase values (>1000 U/L) and hyper bilirubinaemia are often observed. Severe cases of acute hepatitis may progress rapidly to acute liver failure, marked by poor hepatic synthetic function. This is often defined as a prothrombin time (PT) of 16 seconds or an international normalized ratio (INR) of 1.5 in the absence of previous liver disease. We wanted to assess correlation of various types of acute viral hepatitis with liver function tests.

METHODS

The present study was a case control analytical study, conducted among 30 probable cases of acute viral hepatitis, admitted under department of general medicine, KIMS, Karad, during the period of October 2015 to March 2017.

RESULTS

In this study, the majority of the cases presented with nausea/vomiting and dark yellow urine 86.6% (26) cases, followed by anorexia and icterus 83.3% (25) cases, abdomen pain was in 60% (18) cases, fever was in 53.3% (16) cases, hepatomegaly was in 36.6% (11) cases and pruritus was in 23.3.% cases. There was no splenomegaly in any case.

CONCLUSIONS

Mean serum bilirubin in cases of acute viral hepatitis was 6.56 mg/dl. Mean ALT was 1202.2 U/L in cases of acute viral hepatitis.

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BACKGROUND

"Hepatitis" means inflammation of the liver. The liver is a vital organ that processes nutrients, filters the blood, and fights infections. When the liver is inflamed or damaged, its function can be affected. Heavy alcohol use, toxins, some medications, and certain medical conditions can cause hepatitis. However, hepatitis is most often caused by a virus. Acute viral hepatitis (AVH) continues to be a major public health burden in developing countries like India.[1] Studies have previously documented a variable prevalence of hepatotropic viruses: Hepatitis A Virus (HAV) (1.7-67%), Hepatitis B Virus (HBV) (7.3-42%), Hepatitis C Virus (HCV) (1.16-10.6%) and HEV (Hepatitis E Virus) (16.3-66.3%).[2-5] There is the opportunity to prevent or treat the most common types, Hepatitis A and hepatitis B can be prevented by vaccination. Effective treatments for hepatitis C are available but expensive. Prognosis of viral hepatitis mostly determine from prothrombin time and sero-marker.

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Typical symptoms of acute hepatitis are fatigue, anorexia, nausea, and vomiting. Very high aminotransferase values (>1000 U/L) and hyper bilirubinaemia are often observed. Severe cases of acute hepatitis may progress rapidly to acute liver failure, marked by poor hepatic synthetic function. This is often defined as a prothrombin time (PT) of 16 seconds or an international normalized ratio (INR) of 1.5 in the absence of previous liver disease.

Providing that acute viral hepatitis does not progress to FHF, many cases resolve over a period of days, weeks, or months. Acute HBV infection is generally considered resolved once an individual has developed antibodies to the hepatitis B surface antigen (Anti-HBs) and has cleared hepatitis B surface antigen (HBsAg) from their serum.[6] Alternatively, acute viral hepatitis may evolve into chronic hepatitis. HBV infection is considered to have progressed to chronic infection when HBsAg, hepatitis B e antigen (HBeAg), and high titers of hepatitis B viral DNA are found to persist in the serum for longer than 6 months.[6,7,8] Hepatitis C infection is considered to have progressed to chronic infection when HCV RNA persists in the blood for longer than 6 months. [9,10] Hepatitis A and hepatitis E never progress to chronic hepatitis, either clinically or histologically.

The present study was aimed at comparing of various types of acute viral hepatitis with liver function tests.

METHODS

The present study was a case control analytical study, conducted among 30 probable cases of acute viral hepatitis, admitted under department of general medicine, KIMS, Karad during the period of October 2015 to March 2017.

With reference to the study conducted by Shweta et al, among cases of hepatitis, they observed mean SGOT values among cases as 495±115, and among controls 578±90. Using above reference values, at 95% confidence interval, and 90 power the sample size of 27 was calculated. Hence, we took 30 cases and 30 controls for the given study. The sample size of 30 was taken for conveniences.

Inclusion Criteria

Cases

30 Probable cases of acute viral hepatitis with clinical symptoms suggestive of hepatitis or liver Function Test Reports consistent with Acute Viral Hepatitis, AND those cases that were sero-positive for either Hepatitis-A, B, C or E, admitted under department of medicine were included in the present study. Similar number of controls (n=30) were selected in the present study. All the controls were matched for non-modifiable risk factors such as age, gender.

Controls

30 healthy controls, without any clinical symptoms or liver function test suggestive of acute viral hepatitis and sero-negative for hepatitis A, B, C, or E, were selected in the present study. All the controls were matched for non-modifiable risk factors such as age, gender.

Exclusion Criteria

Cases

Patients having coexistent history of diabetes mellitus, coronary heart disease, smoking, alcoholism, familial hypercholesterolemia, taking lipid lowering agents (any condition affecting serum lipid levels) or patients having hypotension or history of ingestion of hepatotoxic drugs or toxins were excluded from the cases selected in the present study.

Controls

Whereas, patients having coexistent history of diabetes mellitus, coronary heart disease, smoking, alcoholism, familial hypercholesterolemia, taking lipid lowering agents (any condition affecting serum lipid levels) were excluded from the controls selected in the present study. All the controls were selected randomly (simple random sampling) from the outpatient department under the department of medicine.

Case Definition of Acute Phase of Acute Viral Hepatitis

Symptoms (Anorexia, Nausea, Vomiting, Alteration of taste, Arthralgia, Malaise in Prodromal phase. Dark urine, Pale colour stool, Prostration, Yellow eyes, Abdominal pain and Pruritus in Icteric phase) and Liver Function Test Reports consistent with Acute Viral Hepatitis.

Recovering Phase of Acute Viral Hepatitis

Absence of constitutional symptoms like anorexia, nausea, vomiting, fatigue, malaise and arthralgia. All the patients were enrolled after written and informed consent. Detailed history was taken. Thorough general and systemic examination was carried out. All findings were recorded in the Patient's Proforma. Investigations, as mentioned in the Patient's Proforma, were carried out on admission and during recovering phase of acute viral hepatitis. Fasting serum lipid profile levels of study group were compared with controls two times, once during the acute phase and then in the recovering phase of viral hepatitis.

Statistical Analysis

Data was entered in using Microsoft Excel software and analysed with the help of Open-epi software. Descriptive statistics was explained by frequency and percentage with the help of tables and graphs. Tests of significance (t-test and ANOVA test) were applied to draw the conclusions. P-value less than 0.05 were considered as significant.

RESULTS

The present study was conducted among probable cases of acute viral hepatitis admitted under the department of general medicine, KIMS, Karad.

In this study, age of the patients was ranging from 21-70 years. The maximum incidence of acute viral hepatitis was in 3rd decade (50%). Age group distribution was almost equal in both groups. Differences of age between two groups were not significant (P value > 0.05).In this study average age of the patients was 35.5 years ± 13.89. Out of 30 both among cases and controls, 22 (73.3%) were male and 08(26.6%) were female. Sex distributions in case and control groups were comparable (Figure 1) (Figure 2).

In this study, the majority of the cases presented with nausea/vomiting and dark yellow urine 86.6% (26) cases, followed by anorexia and icterus were in 83.3% (25) cases, abdomen pain was in 60% (18) cases, fever was in 53.3% (16) cases, hepatomegaly was in 36.6% (11) cases and pruritus was in 23.3.% cases. There was no splenomegaly in any cases (Table 1).

In this study, HEV infection in 73.3% (22) cases was found to be the most common viral infection followed by 13.3 % (04) HAV infection, 6.66 % (02) HBV infection, and 6.66 % (02) HCV infection (Table 2).

All the patients were having ALT value more than 150 IU/L with mean SGPT was 1202.2 ± 867.587 U/L (z-value: 6.64 and p-value <0.0001; statistically significant). Highest value of ALT among the all cases was 3545 U/L and lowest value was 211 U/L (z-value: 6.54 and p-value <0.0001; statistically significant) (Table 3). All patients were having elevated in both direct and indirect bilirubin suggestive of hepatic jaundice. Mean serum total bilirubin in was 6.56 ± 3.806 mg/dl, highest value of bilirubin among the cases was 17.8 mg/dl, while lowest value of bilirubin was 0.6 mg/dl (z-value: 6.31 and p-value <0.0001; statistically significant). Out of 30 patients, 63.4% patients were having serum bilirubin > 5 mg/dl, while only 3.3% patients having normal serum bilirubin (< 1.2 mg/dl.). Mean serum direct bilirubin was 3.676 ± 2.244 mg/dl, while mean serum indirect bilirubin was 2.89 ± 1.656 mg/dl (z-value: 6.17 and p-value <0.0001; statistically significant). Total mean serum albumin was 3.65 g/dl ± 0.260 which was significantly and statistically decreased as compared to controls. In 36.7% patient mean serum albumin was ≤ 3.5 g/dl (borderline), while in 63.3% patients mean serum albumin was > 3.5 g/dl (normal). No one having decreased level of serum albumin (<3 g/dl) (z-value: -3.001 and p-value <0.0027; statistically significant). Among the cases, mean prothrombin time was 17.933 ± 4.118 sec which was significantly increased as compared to controls (z-value: 3.02 and p-value <0.0025; statistically significant).

Mean aPTT was 42.533 ± 11.494 sec which was significantly increased as compared to controls (z-value: 4.065 and p-value <0.0001; statistically significant).

Clinical Presentation	No. of Cases	Percentage (%)
Anorexia	25	83.3 %
Nausea/ Vomiting	26	86.6 %
Fever	16	53.3 %
Icterus	25	83.3 %
Yellow Urine	26	86.6 %
Abdominal Pain	18	60.0 %
Pruritus	07	23.3 %
Hepatomegaly	11	36.6 %
Splenomegaly	00	00 %

Table 1. Clinical Manifestations of Patients with Acute Viral Hepatitis

Type of Hepatitis	No. of Cases	Percentage
HAV	04	13.3 %
HBV	02	6.7 %
HCV	02	6.7 %
HEV	22	73.3 %
Total	**30**	**100 %**

Table 2. Etiological Agent of Acute Viral Hepatitis: Sero-Type of Hepatitis

Liver Profile Parameters	Cases	Controls	z-Value*	p-Value
Mean Alanine Transaminase (ALT)(IU/L)	1202.2 ± 867.587	29.96 ± 20.122	6.64	<0.0001
Mean Aspartate Transaminase (AST) (IU/L)	1064.366 ± 790.037	24.635 ± 9.264	6.34	<0.0001
Mean Alkaline Phosphatase (IU/L)	169.466 ± 32.964	154.3 ± 24.032	1.95	0.05
Mean Total Bilirubin (mg/dl)	6.56 ±3.806	0.953 ± 0.0.454	6.31	<0.0001
Mean Direct Bilirubin (mg/dl	3.676 ± 2.244	0.486 ± 0.302	6.17	<0.0001
Mean Indirect Bilirubin (mg/dl)	2.89 ± 1.656	0.466 ± 00.138	6, 29	<0.0001
Mean Serum Albumin (g/dl)	3.653 ± 0.260	3.92 ± 0.373	-3.001	0.0027
PT (Seconds)	17.933 ± 4.118 ±	15.06 ± 1.257	3.02	0.0025
aPTT (Seconds)	42.533 ± 11.494	34.2 ± 4.215	4.065	<0.0001

Table 3. Mean of Liver Function Test Parameters in Patients with Acute Viral Hepatitis and Controls

*z-value was calculated after applying Mann-Whitney U-test

Liver Profile Parameters		Frequency of Cases with Elevated Liver Enzymes Values	
		Number of Cases	%
Pattern of Bilirubin Rise	Both Direct & Indirect Bilirubin	30	100%
	Only Direct Bilirubin	0	0%
	Only Indirect Bilirubin	0	0%
Serum Total Bilirubin Rise	< 1.2	1	3.3%
	1.2 – 5	10	33.3%
	> 5	19	63.4%
Serum Albumin Levels	< 3	00	0%
	3 - 3.5	11	36.7%
	3.6 - 4.0	18	60%
	4.1 - 5.5	1	3.3%
ALT (IU/L)	151-500	7	23.3%
	501-1000	9	30%
	1001-1500	5	16.7%
	>1500	9	30%
AST(IU/L)	51-150	1	3.3%
	151-500	9	30%
	501-1000	7	23.3%
	1001-1500	5	16.7%
	>1500	8	26.7%
Mean Alkaline Phosphatase (IU/L)	51-150	9	30%
	151-500	21	70%
	501-1000	0	0%

Table 4. Pattern of Elevation of Liver Enzymes among Hepatitis Cases

Parameters		Our Study	Bhattacharya et al[12]	Abbas al-Tamimi et al[11]
Demographic Features	Mean Age	35.50 ± 13.89	25.68	56.8
	Male: Female	2.7:1	1:1.08	--
Clinical Presentations	Anorexia	83.3 %	90 %	--
	Nausea/ Vomiting	86.6 %	70 %	--
	Fever	53.3 %	70 %	--
	Icterus	83.3 %	100 %	--
	Yellow Urine	86.6 %	100 %	--
	Abdomen Pain	60.0 %	30 %	--
	Pruritus	23.3 %	20 %	--
	Hepatomegaly	36.6 %	72 %	--
	Splenomegaly	00 %	14 %	--
Liver Profile	Mean Total Bilirubin (mg/dl)	6.56 ± 3.806	9.90 ±4.64	3.83 ± 2.62
	S. ALT (U/L)	1202.2± 867.587	963.14 ±12.38	-
Aetiology	HAV	13.3 %	25 %	--
	HBV	6.66 %	14 %	--
	HCV	6.66 %	4 %	--
	HEV	73.3 %	30 %	--

Table 5. Comparison of Findings with Other Studies

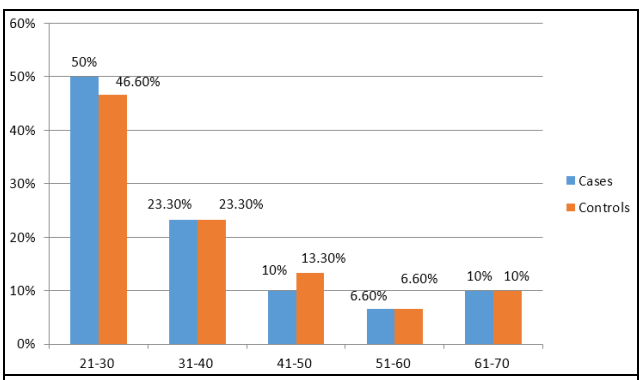

Figure 1. Age Distribution of Cases and Controls

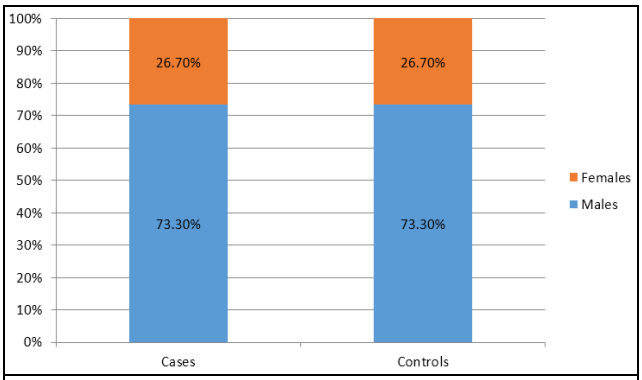

Figure 2. Sex Distribution of Cases and Controls

DISCUSSION

The present study was conducted among probable cases of acute viral hepatitis, with an objective to study clinical presentations of various acute viral hepatitis (viz. Hepatitis A, B, C, D and E), and hence to correlate the diagnosis with liver profile levels.

In this study we enrolled total 30 cases and 30 controls, who were matched for age, gender and risk factors. Mean age for these cases was 35.50 ± 13.89 years and in controls it was 35.86 ± 13.66 years. The mean ages are comparable between the cases and control groups. In a study by Abbas al-Tamimi et al,[11] total number of cases were 63 and the mean age in cases was 30.3 years and in controls it was 36.16 years which is comparable to our study. In the Bhattacharya et al[12] study, total 100 subjects were studied (50 cases, 50 controls). The mean age in cases was 25.68 years and in controls it was 24.2 years (Table 5).

In our study, out of 30 cases, 73% cases were male, while 27% were female, while in Bhattacharya [12] study 48% cases were male and 52% cases were female.

In the present study, the more common clinical manifestations were nausea/vomiting and dark yellow urine which were present in 86.6% (26) cases, followed by anorexia and icterus were in 83.3% (25) cases, abdomen pain was in 60% (18) cases, fever was in 53.3% (16) cases, hepatomegaly was in 36.6% (11) cases and pruritus was in 23.3.% cases. There was no 8 splenomegaly in any cases. Most common symptoms in Bhattacharya et al[12] were jaundice and yellow coloured urine –were present in all (100%) cases followed by anorexia in 90% cases, hepatomegaly in 72% cases, nausea/vomiting and fever in 70% cases, abdomen pain in 30% cases and pruritus in 20% cases (Table 5).

We subjected the cases for biochemical investigations. The mean SGPT in acute phase of viral hepatitis was 1202.2 U/L which was quite near to the Bhattacharya [12,8] study where it was 963.14 U/L. Whereas mean bilirubin value among cases in acute phase of viral hepatitis was 6.56 mg/dl which was near to the Bhattacharya **[12]** study in which it was 9.90 mg/dl.

In our study, HEV infection in 73.3% (22) cases was found to be the most common viral infection followed by 13.3 % (04) HAV infection, 6.66 % (02) HBV infection, and 6.66 % (02) HCV infection; while in Bhattacharya study **[12]** HEV infection in 30% cases was found to be most common viral infection followed by HAV in 25%, HBV in 14% and HCV in 4% cases (Table 5).

CONCLUSIONS

From the current study, it was concluded that maximum number of cases was between the ages of 21 to 40 years. The mean age was 35.2± 13.89 years. In this study, 73.3% had HEV infection, 13.3 % had HAV infection, 6.66 % had HBV infection, 6.66 % (02) had HCV infection and there was no case of HDV infection. Mean serum bilirubin in cases of acute viral hepatitis was 6.56 mg/dl. Mean ALT was 1202.2 U/L in cases of acute viral hepatitis.

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