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A RETROSPECTIVE STUDY: INCIDENCE AND DISTRIBUTION OF VIRAL HEPATITIS AMONG GARHWALI POPULATION IN THE GARHWAL REGION OF UTTARAKHAND

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ABSTRACT

Introduction: All over the world today, around 400 million people are suffering from viral hepatitis. Asia-Pacific region constitutes the epicenter of this epidemic. It is a major cause for health care burden in India. Hepatitis A virus and Hepatitis E virus are predominantly enterically transmitted pathogens, which are purely responsible for acute viral hepatitis whereas Hepatitis B virus and Hepatitis C virus are predominantly spread through parenteral route, responsible for cirrhosis of liver and hepatocellular carcinoma. Hepatitis D virus (defective RNA virus) is present worldwide and usually affects all age groups.

Materials & Methods: The study was carried out upon Garhwali subjects suffering from viral hepatitis at the hepatology clinic, with the co-operation of serology laboratory during the period from January 2015 to December 2018 at H.N.B. Govt. Base Hospital of Veer Chandra Singh Garhwali Govt. Medical Science & Research Institute, Srinagar, Uttarakhand. Serological tests were applied.

Results: This retrospective study was carried out at HNB Base Hospital, revealed that out of 340 hepatitis infected patients, frequencies of among male and female patients are (48.53%) (highest in age group 40-50 yrs) and (51.47%) (highest in 30-40 yrs). The prevalence of HBV (33.52%) > HCV(31.47%) > HAV(21.76%) > HEV(10.29%) > HDV(2.94%).

Discussion/Conclusion: Increase incidence of hepatitis seen in Chamoli, Uttarkashi, Pauri and Rudraprayag districts were due to their proximity to 2013-flood disaster area and many people all over india usually come to these areas every year during the Yatra season. Occupations (Land laborers were found having the highest frequency) played significant role for infections. Contamination played an important criterion for the transmission of viral hepatitis in this hilly region.

KEYWORDS : Viral hepatitis, Garhwali population, Garhwal region.

INTRODUCTION

Viral hepatitis has become one of the major health care burden in India which now equates as a threat comparable to the "big three" communicable diseases – HIV/AIDS, malaria and tuberculosis [1]. Hepatitis A virus (HAV) and Hepatitis E virus (HEV) are predominantly enterically transmitted pathogens which are responsible for the cause of both sporadic infections and epidemics of acute viral hepatitis (AVH), where as Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are predominantly transmit through parenteral route and are notorious to cause chronic hepatitis, which can lead to grave complications including cirrhosis of liver and hepatocellular carcinoma (HCC). Around 400 million people all over the world suffers from chronic hepatitis and the Asia-Pacific region constitutes the epicenter of this epidemic [1].

Hepatitis D virus (HDV) infection is present worldwide and affects all age groups. It does not have uniform distribution and its general pattern is parallel to that of hepatitis B virus (HBV). Its prevalence is highest in some parts of Africa, South America, Romania, Russia and the Mediterranean region included Southern Italy[2]. Approximately 5% of the global HBV carriers are co-infected with HDV. Out of approximately 350 million carriers of HBV worldwide, about 18 million people are infected with HDV[3].

HAV

HAV is basically a single-stranded RNA virus belonging to the family Picornaviridae, spreads via the faecal–oral route and is closely associated with poor sanitary and bad hygienic conditions. HAV infection is common during childhood in developing countries like India and usually results in mild anicteric hepatitis. Majority of children (85%) below the age of 2 years and around 50% aged between 2 and 5 years have nonspecific symptoms and are usually anicteric[4]. However, HAV infection was reported to cause severe disease with increasing age of the patient and with the presence of underlying chronic liver disease. The case fatality rate has been mentioned to be the highest in patients over the age of 50 years (1.8%) when compared to younger adults (0.3%) [5-6]

HEV

HEV is positive-stranded RNA virus belonging to the family Hepeviridae. HEV has 4 genotypes of which genotypes 1 and 2 exclusively infect humans whereas genotypes 3 and 4 usually infect several other mammalian species. HEV is primarily spread via the faecal–oral route andisanenterically transmitted pathogen like HAV. The incubation period of HEV infection is estimated to be around 2–9 weeks and during an epidemic of HEV, anicteric hepatitis is more common than icteric hepatitis and clinical hepatitis is seemingly more frequent in adults than in children aged <15 years [7]. In addition to the classical routes described, HEV is also reported to spread by blood transfusion and via allograft [8-9]. HEV infection can also cause, albeit rarely, a chronic hepatitis which occurs when HEV replication persists for at least 6 months. Chronic HEV infection is classically described with HEV genotype 3 which can lead to cirrhosis in immunosuppressed patients and in patients undergoing a solid organ transplantation [10].

During an outbreak, it is observed that pregnant women have a higher likelihood to get infected with HEV and have a higher propensity to develop acute liver failure (ALF) when compared to non-pregnant females and males [11].

HBV

HBV is a small DNA virus belonging to the family Hepadnaviridae which is transmitted via permucosal or percutaneous exposure to infected body fluids or blood products and it replicates via an RNA intermediate that can integrate itself into the host genome. The spectrum of HBV infection varies from acute to chronic depending on the duration of persistence of HBV surface antigen (HBsAg) in the

serum. Majority of patients with acute infection would remain asymptomatic and only 30% develop icteric hepatitis. The incidence of developing fulminant hepatic failure usually remains low (0.1–0.5%). When HBsAg persists in the serum for over 6 months, the patient has chronic HBV infection. The likelihood of chronicity varies with age, with the risk being ≥90% in neonates and <5% in adults [12]. Based on the prevalence of HBsAg, various geographic areas in the world are classified as having high (≥8%), intermediate (2–7%) and low (<2%) endemicity [13].

HCV

HCV is a single-stranded RNA virus belonging to the family Flaviviridae which causes both acute and chronic infection; however, unlike HBV, HCV has a higher propensity to lead onto chronic viraemia and 25% of these patients can develop chronic hepatitis [14]. HCV has six major genotypes [1,2,5-7] with genotype 1 being the most prevalent genotype globally (46%), followed by genotype 3 in 22% and genotypes 2 and 4 in 13% each [15].

HDV

HDV is known as hepatitis delta virus, and is a defective RNA virus that requires HBV for its virion assembly and penetration into hepatocytes [16]. There are three genotypes of HDV, identified on the basis of analysis of HDV genomes from various parts of the world [17]. The most prevalent worldwide is genotype I, which is related to a broad spectrum of pathogenicity. The United States, Middle East and Europe are the places where genotype I is predominant, with some geographically based subtypes [18,19]. Genotype II is predominant in the Far East [17]. Genotype III is associated with severe forms of hepatitis and is predominant in Northern South America [20]. Hepatitis D prevalence has declined significantly in Europe since 1970s and 1980s when it was first reported. The new foci of infection now seem to be in the developing countries and Asia-Pacific region seems to be an important zone where HDV exists with high prevalence rates. In India, the trend is much more different and HDV infection does not seem to be very common. Still, in Northern India, the prevalence of hepatitis D in HBsAg-positive individuals from New Delhi was reported to be 8.1% in 1996 [21] and 10.6% in 2005[22], which was lower than in Chandigarh in Northern India, where the infection was reported endemic in 1995 and showed a prevalence of 14.2% [23]. In Central India, a study in Indore showed higher prevalence of 5.7% in patients with chronic liver disease, 1.9% in those with acute viral hepatitis, 15% in those with hepatic failure, and 2.3% in those with chronic renal failure [24]. In Kolkata, the prevalence was found to be 3.3% in 1998 [25]. In Mumbai, according to a study done in 1992, the HDV prevalence was 37.46% in HBsAg-positive patients. There was a higher HDV prevalence of 63% in patients with fulminant hepatitis [26]. However, another study from this city showed a prevalence of 16% in patients with acute viral hepatitis, 17% in asymptomatic HBsAg carriers and 19% in patients with chronic liver disease. Among the high-risk population, HDV prevalence was 20% in chronic renal failure patients, 29% in medical professionals and 38% in recipients of multiple transfusions [27]. Delta infection in Ludhiana was reported to be 33% in children with a high prevalence of HDV [28]. Another study from Ludhiana in the same year showed a prevalence of 10% in HBsAg-positive patients [29]. In Southern India, low HDV prevalence in patients undergoing hemodialysis was reported in a study published in 1991 [30]. However, there is high prevalence of HDV in the resident tribes of Andaman and Nicobar islands [31].

MATERIALS & METHODS

The study was carried out upon Garhwali subjects suffering from viral hepatitis at the hepatology clinic, with the co-operation of serology laboratory during the period from January 2015 to December 2018 at H.N.B. Govt. Base Hospital of Veer Chandra Singh Garhwali Govt. Medical Science & Research Institute, Srinagar, Uttarakhand. Data were also available at Medical Record Department (MRD) of HNB Base Hospital, Srinagar (Garhwal), Uttrakhand. Serological tests were applied. In this study, those patients are considered who had visited the hospital clinic more than twice in a year.

Statistically Analysis

Collected data were entered in Microsoft Excel and analyzed using software Statistical Package for Social Sciences (SPSS) version 21.0. Descriptive statistical measures such as percentage, frequency were applied.

RESULTS

Table 1 showed gender wise distribution of hepatitis patients with age group, in which it was found that incidence of hepatitis among the female was found 175 (51.47%) out of 340 cases, higher than that of the male 165 (48.53%) respectively in this study. The occurrence of hepatitis among female was found highest in the age group between 30-40 years followed by in the age group between 40-50 years where as among the male was found highest in the age group between 40-50 years followed by in the age group between 30-40 years.

Table 2 showed comparison between sex distribution and types of hepatitis patients, in which it was found that the association among the all hepatitis patients exhibits the prevalence of HBV (33.52%) > HCV(31.47%) > HAV(21.76%) > HEV(10.29%) > HDV(2.94%). Among the female, the prevalence of hepatitis B (19.11%) is highest which is followed by hepatitis C (16.76%) where as among the male, the prevalence of hepatitis C (14.7%) is highest which is followed by hepatitis B (14.41%).

Table 3 showed the district wise distribution of hepatitis patients, in which it was found that the incidence of hepatitis was highest in the district of Chamoli followed by in the districts of Uttarkashi, Pauri and Rudraprayag respectively. Among the female, the prevalence of hepatitis was highest in the district of Chamoli while among the male was highest in Uttarkashi.

Table 4 showed age wise distribution of hepatitis patients, in which it was found that the incidence of hepatitis A was highest in the age groups 20-30, 30-40 and 40-50 years, incidence of hepatitis B, hepatitis D and hepatitis E were highest in the age group 40-50 years where as the incidence of hepatitis C was highest in the age group 30-40 years.

Table 5 showed the distribution of hepatitis patients with occupation, in which it was found that the incidence of viral hepatitis was maximum among the land laborers followed by the office job workers, drivers and sweepers.

DISCUSSION

Increase incidence of viral hepatitis seen among the females was mainly due to lack of knowledge and education in the rural areas of Garhwal region. Increase incidence of hepatitis seen in Chamoli, Uttarkashi, Pauri and Rudraprayag districts were due to their proximity to 2013-flood disaster area and many people all over india usually come to these areas every year during the Yatra season. Occupations (Land laborers having highest frequency) played significant role for infections. Contaminated water followed by the flood may be one of the important cause of spreading the infection in the every sphere of the society.

CONCLUSION

Viral hepatitis is imposing a major healthcare burden in the Indian subcontinent. Maintaining adequate sanitary and hygienic conditions can help to tackle the problem associated with enterically transmitted pathogens like HAV and HEV. HBV, HCV and HDV infection can cause chronic hepatitis, which can lead to grave complications like development of cirrhosis of liver and HCC. Following a multipronged approach of active screening process, adequate treatment, universal vaccination against HBV and HCV as well as educational counselling can help to decrease the burden of liver diseases associated with HBV and HCV infection in India [32]. There is no effective way of preventing HDV infection in HBV carriers in endemic areas. This can only be achieved by educating such individuals to prevent further exposures to differnt risk factors. In spite of the global trend of decline, significant and persistent

transmission is still present in our nation [33]. In our study, contamination played an important criterion for the transmission of viral hepatitis in the Garhwal region followed by the flood of 2013.

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Conflicts of interest

Nil.

Table 1: Gender wise distribution of Hepatitis Patients with age group

Age group (Yrs)	Sex		Total
	Female	Male	
<20	20	11	31
20-30	34	26	60
30-40	41	37	78
40-50	40	49	89
50-60	24	23	47
60+	16	19	35
Total	175	165	340

Table 2: Compare between Sex Distribution and Hepatitis Patients

Sex	Types of Hepatitis										Total
	A	%	B	%	C	%	D	%	E	%	
Female	31	9.11	65	19.11	57	16.76	5	1.47	17	5	175
Male	43	12.64	49	14.41	50	14.7	5	1.47	18	5.29	165
Total	74	21.76	114	33.52	107	31.47	10	2.94	35	10.29	340

Table 3: District wise distribution of Hepatitis Patients

Sex	District						Total
	Chamoli	Haridwar	Pauri	Rudraprayag	Tehri	Uttarkashi	
Female	51	11	38	20	17	38	175
Male	37	6	32	28	21	41	165
Total	88	17	70	48	38	79	340

Table 4: Age group wise distribution of Hepatitis Patients

Age group (Yrs)	Hepatitis					Total
	A	B	C	D	E	
<20	10	10	5	0	6	31
20-30	16	16	24	1	3	60
30-40	16	27	25	2	8	78
40-50	16	38	18	4	13	89
50-60	10	16	15	3	3	47
60+	6	7	20	0	2	35
Total	74	114	107	10	35	340

Table 5: Distribution of Hepatitis Patients with Occupation

Sex	Occupation						Total
	Driver	House hold	Land Labour	Office job	Student	Sweeper	
Female	0	22	55	47	28	23	175
Male	60	0	63	23	5	14	165
Total	60	22	118	70	33	37	340

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