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Original article

Seroprevalence and risk factors in blood-borne viral hepatitis cases attending a tertiary care hospital in Lucknow

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Abstract

Background: Blood-borne viral hepatitis is a major public health problem and is an important cause of morbidity and mortality, worldwide. Data regarding prevalence of HBV and HCV in our region is not available. To study the prevalence and risk factors of viral Hepatitis B and Hepatitis C cases in patients attending a tertiary care hospital in Lucknow,U.P.

Materials and methods: A prospective study of HBV and HCV positive cases was performed. Demographic details and risk factors were analyzed**.** Fisher's exact test was used and a p value of < 0.05 was considered to be statistically significant**.**

Results: Out of total 2737 patients screened 103 (3.7%) were found to be positive for Hepatitis B surface antigen (HB $_s$ Ag +ve) and 35 (1.7%) for anti-HCV antibody by rapid card test. Hepatitis B was more prevalent in males (45.6%) of 31-40 years age group (26.9%) with low education (27.2%) belonging to middle socioeconomic status (34.8%). Prevalence of HCV was more in illiterate (37.1%), females (13.8%) of 31-40 years age group (57.9%) belonging to middle socioeconomic status (45.7%). Use of unsterilized needle (29%) was the most common risk factor followed by drug abuse (23.2%) in both type of hepatitis cases. On comparison between HBV and HCV cases, statistically significant differencebetweenindoorandoutdoorpatients,malefemaleratio,literacylevels,socioeconomicstatusandriskfactorswasfound.

Conclusion: Prevalence of HBV and HCV were found to be inversely related to education level and socioeconomic status. Therefore, preventive measures should include health education regarding parentral transmission of infection, implementation of stringent blood banking laws, use of disposable syringes/needles should be made mandatory and reuse of needles, shaving kitsandrazorbladesshouldbediscouraged.Inclusionof HBVimmunization in national immunization programmeis showingpositiveresults, asweobservedonlytwocasesofHBVin <10 yearsagegroup.

Introduction

Blood-borne viral hepatitis is caused by Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Hepatitis D virus (HDV). HBV and HCV infections are still one of the most common causes of acute and chronic liver disease world-wide. Viral hepatitis is a subject of profound concern and results in about 10,000 new research papers each year, from molecular structure to newest treatments. Major new advances in diagnosis and treatment have been made for better management of infected cases[1]. Hepatitis B virus (HBV) is the most important causative agent of blood borne hepatitis in humans. Hepatitis D Virus (HDV) infection occurs either as a co-infection or super-infection in HBV carriers. Hepatitis- B infection is a major health problem all over the world. There are presently about 350 million chronic carriers of HBV in the world population out of which around 50 million are inIndia.[2]

Hepatitis C virus (HCV) is the major cause of transfusion non-A, non-B hepatitis and continues to be a major cause of human liver disease throughout the world.[3] Hepatitis C virus (HCV) is a parenterally transmitted virus that is responsible for 170 million cases of chronic hepatitis in the world. About 75-80% of those persons infected with HCV tend to become chronic carriers and the majority of these patients are asymptomatic.[4] HBV carrier rate in India is approximately 4% and antibodies against hepatitis C virus (HCV) are present in 1-1.5% of Indian population.[5] The noted

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increase in prevalence over time, as well as the high prevalence among patients may suggest that there is a need to have up to date data of HBV and HCV infection. The information is also important in relation to the adoption of recommendations made by W.H.O. on screening of patients, especially pregnant women and offering the at-birth-dose of HBV vaccine to prevent perinatal transmission for those mothers who test positive.

The study was undertaken to determine the prevalence and risk factors of HBV and HCV in patients visiting an upcoming tertiary care hospital in Lucknow.

Materials and methods

A prospective study from January 2014 to June 2014 of 2737 cases referred from various clinical departments to the Department of Microbiology in an upcoming tertiary care hospital in Lucknow; for screening of blood-borne viral hepatitis markers namely, HB_sAg and anti-HCV antibody was performed. All samples were first screened by rapid card test for HB_sAg and anti-HCV antibody (J MitraTridot), indeterminate test samples were repeated on conventional ELISA test (Transasia). The study was approved by the Institutional Ethical Committee. Written informed consent was taken from every positive patient and those unwilling were excluded from thestudy.

Patients being positive for any of the markers for HBV or HCV were enrolled in the study and their demographic details and risk factors were analyzed. A comparative analysis of HBV and HCV positive cases was done and statistical analysis of the data was done using, Chi-square test or Fisher's exact test and significant p value (<.05) wasrecorded.

Results

Out of a total 2737 patients screened for HBV and HCV 103 (3.76%) were positive for HBV and 35 (1.3%) for HCV.All138caseswerepositivebyELISAbutsensitivityofrapidcard test was around 95%. Demographic details and risk factors of positive cases were recorded and a comparative analysis between HBV and HCV was performed. Out of total 138 positive cases of blood-borne viral hepatitis, majority of cases (74.6%) belonged to HBV and only 24.6% cases were of HCV. No case of HBV and HCV co-infectionwas observed. Positive cases predominated in indoor patients (65.2%) compared to outdoor ones (34.8%) and this difference wasstatistically significant (p<0.00). HBV positive cases predominated in both indoor (47.8%) and outdoor (26.8%) cases, while HCV positivity was 17.4 % and 8.0% respectively (p<0.00) (Table 1.).

Overall more than half (67.2%) of the patients were male, out of which 45.6 % were HBV positive but only 11.6% were HCV positive (p<0.00). Prevalence of HBV was also more (29%) in females compared to HCV (13.8%) [p<0.00]. Most common age group affected was 31-40 years (31.2%) followed by > 50 years (23.2%), 41-50 (20.3%), 21-30 (21%) and 10-20(5.1%). Statistically significant difference was found while comparing HBV and HCV prevalence, in both males (p<0.01) and females (p<0.03) of 21-40 years age group and male patients of 31-40 (p<0.01), 41-50 (p<0.03) and >50 years (p<0.04) age groups. Children < 10 years of age were least infected, with only two cases (1.4%) were found to be only HBV positive (Table 2). In the present study, about three fourth (73.1%) of all cases were literate, out of which higher number of HBV positive cases (20.3%) were having only primary level of education, while in HCV positive group majority of cases (37.1%) were illiterate or less educated (17.1%) and belonged to middle socio-economic status (45.7%). In HBV positive group, all patients were almost equally distributed in all three categories of socioeconomic status (SES) whereas, in HCV positives, majority of patients belonged to middle (45.7%) and high (34.3%) SES groups. Comparative analysis of HBV and HCV cases on the basis of education (p<.01) and SES (p<0.00) was found to be statistically significant. (Table 5). Most common risk factor was unsterilized needle use (29%) followed by drug abuse (23.2%) in both viral groups. Dental procedures (11.4%) and blood transfusion (8.6%) were more common in HCV positive cases, while minor surgeries (7.2%), contact with multiple sex workers (2.7%) and contact with hepatitis case (0.9%) was observed in HBV positive group. Statistically significant difference between HBV and HCV cases was found in unsterilized needle use (p<.001), drug abuse (p<.007), minor surgery (p<.039) and unknown status (p<.036) (Table6).

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Table-1: Distribution of H BV and HCV positive cases

Patient category	N (%)	HBVpositive N = 103 (%)	HCV positive N = 35 (%)	p value
Indoor	90 (65.2)	66 (47.8)	24 (17.4)	<0.00*
Outdoor	48 (34.8)	37 (26.8)	11 (8.0)	<0.00*
Total	138 (100)	103 (74.6)	35 (25.4)	<0.00*

Table-2: Age and sex distribution of Hepatitis B and C patients

Age groups (years)	Total N = 138 (%)	Male		P value	Female		p value
		Hepatitis B positive N = 63 (%)	Hepatitis C Positive N =16 (%)		Hepatitis B positive N = 40 (%)	Hepatitis C positive N = 19 (%)	
<10	2 (1.4)	2 (3.1)	0 (0)	0.50	0 (0)	0 (0)	-----
10-20	7 (5.1)	5 (7.9)	1 (6.2)	0.21	1 (2.5)	0 (0)	1.0
21-30	29 (21)	14 (22.5)	3 (18.8)	0.01*	10 (25)	2 (10.5)	0.03*
31-40	44 (31.2)	17 (26.9)	5 (31.2)	0.01*	11 (27.5)	11 (57.9)	1.0
41-50	28 (20.3)	12 (19.0)	3 (18.8)	0.03*	10 (25)	3 (15.8)	0.09
>50	32 (23.2)	13 (20.6)	4 (25)	0.04*	8 (20)	3 (15.8)	0.22
Total	138 (100)	63 (45.6)	16 (11.6)	0.00*	40 (29.0)	19 (13.8)	0.00*

Table-3: Gender distribution of Hepatitis B and C cases

Gender	N =138 (%)	Hepatitis B N = 103 (%)	Hepatitis C N =35 (%)	p value
Male	103 (74.6)	63 (45.6)	16 (11.6)	0.00*
Female	35 (25.4)	40 (29)	19 (13.8)	0.00*

Table-4: Distribution of Hepatitis B and C patients according to education

Education level	N =138 (%)	Hepatitis B N=103 (%)	Hepatitis C N =35 (%)	p value
Illiterate	37 (26.9)	24 (17.4)	13 (37.1)	0.09
Primary	34 (24.6)	28 (20.3)	6 (17.1)	0.00*
High school to Intermediate	34 (24.6)	27 (19.5)	7 (20)	0.001*
Graduate +	33 (23.9)	24 (17.4)	9 (25.7)	0.014*

Table-5: Distribution of Hepatitis B and C patients according to Socio Economic Status

Socio Economic Status	N =138 (%)	HepatitisB N =103 (%)	Hepatitis C N =35 (%)	p value
High	45 (32.8)	33(31.9)	12 (34.3)	0.003*
Middle	49 (35.5)	36(34.8)	16 (45.7)	0.008*
Low	41 (29.7)	34(33.3)	**7 (20.0)**	**0.000***

Table 6: Distribution of Hepatitis B and C patients according to risk factors

Risk factors	N = 138 (%)	Hepatitis B N = 103 (%)	Hepatitis C N = 35 (%)	p- value
Unsterilized Needle use	40 (29)	31 (22.5)	9 (25.7)	0.001*
Drug abuse	32 (23.2)	24 (23.3)	8 (22.8)	0.007*
Dental procedures	12 (8.7)	8 (7.2)	4 (11.4)	0.38
Minor surgery	9 (6.3)	8 (7.2)	1 (2.8)	0.03*
Blood Transfusion	5 (3.5)	2 (1.8)	3 (8.6)	1.0
Major surgery	4 (2.9)	3 (2.7)	1 (2.8)	0.62
Infected spouse	4 (2.9)	3 (2.7)	1 (2.8)	0.62
Contact with multiple sex workers	3 (2.2)	3 (2.7)	0 (0.0)	0.25
Contact with hepatitis case	1 (0.8)	1 (0.9)	0 (0.0)	1.0
Unknown	28 (20.3)	20 (19.4)	8 (22.8)	0.036*

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Discussion

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are one of the most common causes of chronic liver disease (CLD) worldwide, and can lead to cirrhosis and hepatocellular carcinoma HCC[4]. Several studies on AVH are available from India and abroad that have reported varying prevalence of hepatotropic viruses- HBV (7.3-42%), and HCV (1.16-10.6%) [5]. In a study done in Lucknow, high prevalence was identified for HBV (16.10%) and HCV (11.98%)[6]. In the present study the prevalence rate was found to be 3.76% in HBV and 1.76% for HCV. A low prevalence of HCV infection (4%) was seen in Aligarh and its surrounding region. Prevalence levels similar to ours (2.5%) have been reported from South India**.**[7] On the contrary, a very high prevalence (37.5%) of HCV has been reported from Delhi.[8] No case of HBV and HCV co-infection was found in our study however HBV and HCV co-infection was reported by Jain *et al*., in Lucknow.[6] Male female ratio for HBV was 1.5:1, contrary to 1:1.2 found in HCV infection and on comparing both HBV and HCV positive viral infections statistically significant values were found in males p≤0.00. The seropositivity in both the categories of infections was found to increase till age of 40 years and then declined. The prevalence rate was 1.4% in <10years age group which increased to 5.1%, 21%, and 31.2% in 10-20, 21-30 and 31-40 years age groups respectively and then started declining to 23.2% and 20.3% in >50 years and 41-50 years age groups respectively. Similar findings have been reported by others[9] and these findings show a positive impact of inclusion of HBV immunization in National Immunization Programme by the government of India. In the present study, prevalence of HBV and HCV was found to be morein literates at around 73.1% and 76.7% respectively. HBV cases were almost equally distributed in low (33.3%) middle (34.8%) and high (33.3%) socio-economic status groups, contrary to previous report of an increased prevalence in illiterates reported from Delhi.[10] The prevalence of HCV was higher in illiterates (37.1%)and middle (45.7%) socio-economic status, similar to findings by Wang *et al*. from Taiwan[11]. Statistically significant values were observed in low socio-economic status (p≤.003) and literacy (p≤ .01) while comparing HBV and HCV positive patients. The most common risk factors in both types of infections were, unsterilized needle use (29%), followed by drug abuse (23.2%), dental procedures (8.7%), surgical operations (6.3%). Blood transfusion (8.6%) came out to be an important risk factor in hepatitis C cases. Three (2.7%) patients all HBV positive, gave history of sex with multiple partners and 4 (2.9%) cases acquired infections from their infected partners. On comparing the risk factors statistically significant values were observed in unsterilized needle use (p≤.04) and for blood transfusion (p≤.01) factors. Similarly no history for possible route of transmission could be elucidated in 19.4% and 22.8% of cases in HBV and HCV cases respectively. Similar observations were seen in a study done in Delhi by Thakur *et al*.[12] In our study, sensitivity of ELISA test was 100% compared to 95 % of Rapid card test, therefore relying on single card test for screening, might give false negativeresult.

Conclusion

To conclude, results of the present study hint towards importance of awareness programmes in prevention of blood-borne viral hepatitis, as young adults and middle aged population are most affected. The preventive measures include health education regarding parentral transmission of infection, stringent blood banking laws; use of disposable syringes/needles should be made mandatory. Reuse of needles, shaving kits and razor blades should be discouraged. All this is not possible without increased public awareness of the magnitudeandimplicationsofthischronicinfectionand,itsmodeof spread. Health authorities have to include hepatitis B and C on their radar as a disease, which can result in significant morbidity and mortality in the years to come. Small sample size is a limitation of our study and to confirm the findings of our study, a larger population based cross-sectional studyis needed.

Conflicts of interest – None declared.

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