



SEROPREVALENCE OF HEPATITIS B AND HEPATITIS C INFECTION IN A TERTIARY CARE HOSPITAL IN NORTH-EAST INDIA AND CO-INFECTION WITH HIV

Microbiology

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ABSTRACT

INTRODUCTION: Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are the most common cause of chronic liver disease worldwide. In India, HBV accounts for approximately 40 million carriers and approximately 10 million people are infected with HCV. Because of the shared modes of transmission, co-infection of HBV and HCV is not uncommon. Co-infected persons tend to have more severe liver injury, higher probability of liver cirrhosis and higher incidence of hepatocellular carcinoma. Further the presence of these infections with HIV presents unique management challenges since the optimal regimen of therapy still remains unclear.

OBJECTIVE: Study of seroprevalence of Hepatitis B and Hepatitis C infection and their co-infection with HIV

METHOD: A retrospective analysis of patients who attended NEIGRIHMS, Shillong from January 2013 to June 2016 was done. Patients tested positive for HBV and HCV using ELISA were taken. From amongst these patients those positive for HIV were also included. All relevant data such as patient particulars, risk factors & diagnosis was recorded.

RESULT AND DISCUSSION: In the period of study, out of a total of 62,709 patients, 855(1.4%) patients tested positive for Hepatitis B, 262(0.4%) patients tested positive for Hepatitis C while 9 patients had both Hepatitis B and Hepatitis C. Amongst the patient tested positive for Hepatitis B or C, 5 patients were found to be co-infected with HIV. Co-infection of Hepatitis B and HIV were found in 4 patients and 1 patient was positive for Hepatitis C and HIV. Males were predominantly affected in both Hepatitis B (67.1%) and Hepatitis C (74%). The predominant age group was 21-40 years. Co-infection with Hepatitis B and C was mostly seen amongst patients with chronic kidney disease and on dialysis. Hepatitis C was more common amongst the drug users.

CONCLUSION: The high seroprevalence of these hepatotropic viruses calls for strengthening programmes for prevention and control such as nationwide vaccination programmes for Hepatitis B. HIV coinfection more than triples the risk for liver disease, liver failure, and liver-related death from HCV. Hence it is advisable to screen all HBV and HCV infection for HIV co-infection and vice versa.

KEYWORDS:

Hepatitis B, Hepatitis C, HIV- Coinfection

INTRODUCTION:

Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are the most common cause of chronic liver disease worldwide. Around 500 million are chronically infected with HBV and HCV and together they are estimated to cause around one million deaths. In the South-East Asia region, the burden of chronic HBV infection is estimated to be around 100 million and that of chronic HCV infections is 50 million. HBV is the second most common cause of acute viral hepatitis after HEV in India. In India, HBV accounts for approximately 40 million carriers and approximately 10 million people are infected with HCV¹. Because of the shared modes of transmission, co-infection of HBV and HCV is not uncommon. Co-infected persons tend to have more severe liver injury, higher probability of liver cirrhosis and higher incidence of hepatocellular carcinoma. Further the presence of these infections with HIV presents unique management challenges since the optimal regimen of therapy still remains unclear. Studies in different parts of India shows that the rates of infection with Hepatitis B, C and co-infection with HIV varies in the different geographic areas, the particular risk groups as well as exposure²⁻⁵. Studies with regard to the seroprevalence of Hepatitis B and C is scarce from this part of the Indian subcontinent hence this study was undertaken to find out the seroprevalence of Hepatitis B and Hepatitis C infection and the co-infection of Hepatitis B and C with HIV. Such information would help in creating long term strategies to improve public health care and prevent such infections.

METHOD:

A retrospective analysis of patients who attended North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong from January 2013 to June 2016 was done. NEIGRIHMS is a tertiary care centre in Meghalaya, a North Eastern part of India. Patients were screened for HBsAg and Anti HCV using ELISA methods. HBsAg was screened using Biorad Monolisa HBsAg

ULTRA (USA). This assay is a qualitative one-step enzyme immunoassay based on the principle of sandwich type using monoclonal antibodies and polyclonal antibodies which has the ability to bind themselves to the various subtypes of HBsAg. The tests were performed according to manufacturer's instructions and reported to have a sensitivity and specificity of 100% and 99.94% respectively. Anti HCV was screened using Erba diagnostics ELISA kit. The ERBA ELISA HEPATITIS C is a third generation solid phase immunoassay, utilizing a mixture of synthetic peptides and recombinant proteins of HCV i.e., CORE, NS3, NS4 and NS5 for detection of HCV antibodies present in human serum and plasma. All the reactive samples were tested again using rapid test kit (SD Bioline) based on the principle of one step immunochromatographic assay. All the positive samples with the exception of 2 samples where the rapid test showed negative results were included in this retrospective analysis. From amongst these patients, those positive for HIV were also included. All relevant data such as patient particulars, risk factors & diagnosis was recorded.

RESULT AND DISCUSSION:

In the period of study, out of a total of 62,709 patients, 855(1.4%) patients tested positive for Hepatitis B, 262(0.4%) patients tested positive for Hepatitis C while 9 patients had both Hepatitis B and Hepatitis C (Table 1).

Table 1: Distribution of Hepatitis B and C among the different sex and age groups

Age Group (Years)	Hepatitis B (855)		Hepatitis C (262)		Hepatitis B and Hepatitis C (9)	
	Male	Female	Male	Female	Male	Female
1-10	2	2	0	0		
11-20	58	25	9	2	2	0
21-30	150	77	59	11	3	0

31-40	127	77	69	26	3	1
41-50	114	52	39	14		
51-60	73	29	11	11		
61-70	41	15	3	3		
71-80	8	4	4	0		
81-90	1	0	0	1		
Total	574 (67.13%)	281(30.6 4%)	194 (74.04%)	68 (25.95%)	8(89%)	1 (11%)

Males were predominantly affected in both Hepatitis B (67.1%) and Hepatitis C (74%). The predominant age group was 21-40 years.

Table 2: Department wise distribution of positive samples

Department	OPD	WARD	Total
Obstetrics and Gynaecology	34	23	57
Medicine	386	204	590
Surgery	58	37	95
Urology	32	14	46
CTVS	2	29	31
Cardiology	4	34	38
Paediatrics	5	9	14
Orthopaedics	7	8	15
ENT	40	8	48
Ophthalmology	14	1	15
Oncology	3	6	9
Neurology	11	41	52
Neurosurgery	1	18	19
Dermatology	27	0	27
Emergency	0	23	23
Dialysis Unit	8	0	8
ICU, ICCU	0	39	39
GRAND TOTAL	632	494	1126

Table 2 shows the positive samples received from the various departments for screening of HBsAg and Anti HCV. The majority of positive samples were from Medicine Department. Among the high risk groups, it was seen that amongst the patients undergoing Dialysis, six tested positive for Anti HCV, one was reactive for HBsAg and one patient had co-infection. Among the patients with Chronic kidney disease referred from Urology Department, it was seen that 22 were positive for HBsAg, 16 for Anti HCV and one had coinfection. Sixteen of the patients already diagnosed with Hepatocellular carcinoma were positive for HBsAg and 3 for Anti HCV. From among the patients attending Dermatology OPD for tattoo removal, 5 were positive for HBsAg and 4 were positive for Anti HCV. Coinfection was seen in 1 case. Three of the patients who gave a history of drug abuse had test results reactive to Anti HCV. Co-infection with Hepatitis B and C was mostly seen amongst patients with chronic kidney disease and on dialysis.

Amongst the patient tested positive for Hepatitis B or C, 5 patients were found to be co-infected with HIV. Co-infection of Hepatitis B and HIV were found in 4 patients and 1 patient was positive for Hepatitis C and HIV.

DISCUSSION: Hepatitis B and C is a serious "silent epidemic" challenge to India. Chronic carriers are sometimes unaware of their status and continue to infect others. Coinfection increases the risk of liver failures, chronic liver diseases and cancers. HBV is reported to be responsible for 70% of cases of chronic hepatitis and 80% of cases of cirrhosis of the liver.

In this study, amongst the 62,709 patients screened, the overall seroprevalence of HBsAg was found to be 1.4% and for Anti HCV was found to be 0.4%. Co-infection of Hepatitis B and C was found in 9 patients (0.01%). This is similar to a study done by Smita Sood and Shirish Malvanka, where the seroprevalence of HBsAg was 1.04% and seroprevalence of Anti HCV among the hospital-based population was found to be 0.28%. In India, the prevalence of HBsAg is 3-4.2% and antibodies against HCV are present in approximately 15 million people with a prevalence rate of 2%. According to WHO, in this part of the country seroprevalence of HBsAg falls under a low prevalence category. Studies done in other parts of India have shown a slightly higher seroprevalence as compared to this study⁸⁻¹¹. Aggarwal P et al (2015)¹² had reported an even higher prevalence of Hepatitis C among

healthy blood donors in Punjab, one of the reasons being attributed to the menace of drug addiction. Similarly in our analysis, Hepatitis C was more common amongst the drug users.

Although there has been extensive vaccination against HBV in many countries, yet HBV and HCV still ranks among the most frequent reportable infectious diseases throughout the world even after considerable underreporting. This highlights major health and diagnostic issues since millions of people get affected. HBV is a leading cause of morbidity and mortality, not only because of the acute illness but also due to its chronic sequelae like chronic hepatitis, cirrhosis, and hepatocellular carcinoma, accounting for more than a million deaths worldwide¹³. HCV is more severe than HBV because it has remarkable ability to persist and produce chronic and irreversible liver damage with long term consequences^{14,15}. The non-availability of vaccine against HCV further compounds the problem and hence is a major health concern. WHO recommends routine infant vaccination along with catch-up immunization for adolescents and high risk population groups. India introduced universal immunization against hepatitis B in 10 states in the year 2002, and in 2011, scaled up this operation countrywide. The inclusion of HBV vaccination in the universal immunization schedule which has now started as "Mission Indradhanush", launched by the Central Government of India on 25th December, 2014 with a mission to completely immunize children against seven diseases including hepatitis B, by the year 2020 is a major step to further strengthen the preventive measures against HBV. In this study it was seen that from amongst the seropositive patients, 5 were coinfecting with HIV. The characteristics of HIV infected persons differ according to the co-infecting hepatitis virus, their epidemiologic patterns may change over time. Co-infection can cause long term illness and death of the patients. People with HIV who are co-infected with either HBV or HCV are at increased risk for serious, life-threatening complications. The management of HIV infection further gets complicated as a result of co-infection. Hence surveillance systems are needed to monitor their infection patterns in order to ensure that prevention measures are targeted appropriately.¹⁶

CONCLUSION: The high seroprevalence of these hepatotropic viruses calls for strengthening programmes for prevention and control such as nationwide vaccination programmes for Hepatitis B. HIV coinfection more than triples the risk for liver disease, liver failure, and liver-related death from HCV. Hence it is advisable to screen and immunize all high-risk groups with HBV vaccination, such as those with history of exposure, risky practices, and occupational risk; specific measures for prevention of mother-to-child transmission and promoting safe blood supply, safe injections and safe sex. The results of these prevalence studies should help in the creation of long-term strategies to improve public health and to prevent spreading of the disease in the local population. Further, continuous surveillance studies are required for these viral infections in a broader population which would enable us to determine strategies for combating them.

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