



Seroprevalence of hepatitis B Surface Antigen and anti-hepatitis C virus in HIV positive patients Ajmer, Rajasthan, India

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Abstract

The aim was to determine the seroprevalence of HIV, hepatitis B virus (HBV), hepatitis C virus (HCV) and co-infection among Hospital based population in Ajmer Rajasthan. Limited data is available, at Rajasthan state level, on the seroprevalence of these blood borne pathogens. Sexually transmitted infections and HIV/AIDS are a major public health concern owing to both their prevalence and propensity to affect offspring through vertical transmission. Serum samples collected over a period of 12 months from August 2015 to July 2016, of patients attending ICTC (G) of J.L.N. Medical College and associated Hospital, Ajmer using rapid card tests. The prevalence of Hepatitis B was found to be 2.5% and Hepatitis C as 1.2%. The prevalence was then estimated for both the sexes and different age groups. Males were more affected than females. The 16-35 age group was affected the most. The present study shows that the HIV patients may be co-infected with other infectious diseases which have mode of transmission through sexual, blood and blood products and others, thus patients may be co-infected with HBV and HCV through these common modes of transmission. The presence of such co-infection may not only affect the natural course of HIV but also influence the clinical presentation and other infection also.

Keywords: HIV, HBV, HCV, Seroprevalence and Co-infection

Introduction

The largest epidemic facing mankind today is human immunodeficiency virus (HIV) infection [1]. Sharing the same risk factors, hepatitis C virus (HCV) and hepatitis B virus (HBV) infection are common in HIV participants [2]. HIV patients may be co infected with other infectious organisms which are transmitted through common modes of transmission. In majority of cases (>90%), mode of transmission is unsafe sexual contacts [3].

Hepatitis B virus and hepatitis C virus are among the principal causes of severe liver diseases, including hepatocellular carcinoma (HCC) and cirrhosis related end-stage liver diseases [4]. Hepatitis B virus infection that shares similar transmission routes with HIV [5]. Over 2 billion of the world's population has been exposed to HBV and HBV carrier's rate in India is approximately 3%. Hepatitis B surface antigen (HBsAg) is the first seromarker to indicate active HBV infection, either acute or chronic [6].

Hepatitis C virus infection is a major public health problem especially in developing countries like India [7]. And antibodies against Hepatitis C virus are present in 1-1.5 of Indian population [8]. HCV causes both acute and chronic infections. Acute HCV infection is usually asymptomatic, and is only very rarely associated with life threatening disease (<http://www.who.int/mediacentre/factsheets/fs164/en/>). The prenatal risk of HCV transmission can be significantly reduced to <1% in infants born to HIV/HCV co-infected mothers if mother is on ART [9].

By contrast with HBV, sexual transmission of HCV less efficient, through patients with high risk sexual behavior still have high risk of acquiring HCV infection sexually [10]. In post HAART era, life expectancy of the patients have increased

and the focus has now shifted to the management of concurrent illness such as chronic HBV and HCV and other co-infections which has potential to increase the long term morbidity and mortality [11]. The knowledge of the magnitude of such co-infections is of great importance in making the therapeutic decision while managing the patients.

Materials and Methods

This study was carried out in the Department of Microbiology, Jawaharlal Nehru Medical College ICTC (G) and associated hospital Ajmer, Rajasthan. Patients who registered at the ICTC (G) counselling centre of the hospital from August 2015 to July 2016 in randomly selected HIV positive patients of both sexes. The present study is aimed to find out the prevalence of HIV, Hepatitis B and Hepatitis C and their correlation with regard to history, clinical examination and laboratory parameters were studied.

Clinical evaluation was done by taking detailed history, including sex, occupation, residence and personal habits.

The diagnostic technique used for detection of HIV, HBV and HCV infection was done by following kits:

- HIV Rapid
 - COMB AIDS (Span Diagnostic Ltd)
 - SD Bioline HIV 1/2 3.0
 - Meriscreen HIV 1-2 WB (Meril Diagnostic Pvt. Ltd.)
- HBsAg
 - Virucheck HBsAg (Orchid Biomedical System)
- Immunochromatography HCV
 - HCV TRI-DOT (Diagnostic Enterprises Ltd.)
 - Dot blot technique

Observation and Results

In our retrospective study out of 315 HIV co-infected patients,

most of the patients were infected with HBV than HCV. In HIV co-infected patients n=12, 8(2.5%) were HBsAg positive and 4(1.2%) were anti HCV positive.

The prevalence of HIV-HBV co-infection was 2.5% and the HIV-HCV virus co-infection was 1.2%. In our study group, HBV co-infection were more prevalent in male group 6/315(1.90%) than the female group 2/315(0.63%).

In our study, the routes of transmission for these co-infections were found to be as shown in table and heterosexual route is the most common route (Table1).

In both of the cases, HIV co-infection was acquired by heterosexual route (1.90%) and in significant fraction of

patients route of transmission was not known (0.95%) (Table1). The prevalence of HIV co-infected was found to be maximum in the age group 16-35 years in both males (Table3) and females (Table4). Majority of the patients were either primary school (1.58%) or had schooling below the primary standard (0.95%) (Table5). The prevalence of HIV-HBV co-infection was highest (2.5%) than HIV-HCV co-infection (1.26%). There is variable difference in the prevalence of HIV-HBV and HIV-HCV co-infection in the present study and other studies. In HIV-HBV and HIV-HCV co-infection the mode of transmission were heterosexual.

Table 1: Mode of transmission of cases of HIV-HBV and HIV-HCV

Mode of transmission	HIV-HBV N=8		HIV-HCV N=4		Total N=315	
	N	%	N	%	N	%
Heterosexual	4	1.26	2	0.63	6	1.90
Homosexual	0	0.0	0	0.0	0	0.0
Vertical transmission	0	0.0	0	0.0	0	0.0
Intravenous drug users	1	0.31	1	0.31	2	0.63
Blood transfusion	1	0.31	0	0.0	1	0.31
Unknown	2	0.63	1	0.31	3	0.95
Total	8		4		12	

Table 2: Age wise distribution of HIV-HBV and HIV-HCV

Age group (Years)	HIV-HBV N=8		HIV-HCV N=4		Total N=12	
	N	%	N	%	N	%
16-25	2	0.63	2	0.63	4	1.2
26-35	3	0.95	1	0.31	4	1.2
36-45	1	0.31	1	0.31	2	0.63
46-55	1	0.31	0	0.0	1	0.31
>55	1	0.31	0	0.0	1	0.31
Total	8		4		12	

Table 3: Age wise distribution of Male patients of HIV-HBV and HIV-HCV

Age group (Years)	HIV-HBV N=6		HIV-HCV N=3		Total N=9	
	N	%	N	%	N	%
16-25	2	0.63	0	0.0	2	0.63
26-35	1	0.31	2	0.63	3	0.95
36-45	2	0.63	1	0.31	3	0.95
46-55	1	0.31	0	0.0	1	0.31
>55	0	0.0	0	0.0	0	0.0
Total	6		3		9	

Table 4: Age wise distribution of Female patients of HIV-HBV and HIV-HCV

Age group (Years)	HIV-HBV N=2		HIV-HCV N=1		Total N=3	
	N	%	N	%	N	%
16-25	0	0.0	0	0.0	0	0.0
26-35	1	0.31	0	0.0	1	0.31
36-45	1	0.31	0	0.0	1	0.31
46-55	0	0.0	1	0.31	1	0.31
>55	0	0.0	0	0.0	0	0.0
Total	2				3	

Table 5: Educational status of cases of HIV-HBV and HIV-HCV

Education level	HIV-HBV N=8		HIV-HCV N=4		Total N=12	
	N	%	N	%	N	%
Illiterate	2	0.63	1	0.31	3	0.95
Primary school	3	0.95	2	0.63	5	1.58
Secondary school	2	0.63	1	0.31	3	0.95
College above	1	0.31	0	0.0	1	0.31
Total	8		4		12	

Discussion

In our study, out of the 315 most of the patients were infected with HBV than HCV and in comparison to study group number of co-infected patients were small (2.5%) and (1.2%).

Few of these studies, which have been done on HIV and co-infection (HBV and HCV) in India and foreign are shown in the table-6

Table 6: The prevalence of HIV and co-infection in India and various other countries.

Study	Population group	Country	HIV-HBsAg +ve %	HIV-anti HCV +ve %	Size of study group
Present	HIV +ve	India	2.5%	1.26%	315
Zaho <i>et al</i> (20)	HIV+ve	China	12.6%	41.2%	2087
Ahsan <i>et al</i> (19)	HIV+ve	India	3.5%	8.0%	200
Treitinger <i>et al</i> (14)	Blood donar & HIV +ve	Brazil	3.1%	51.7%	-
Anurag <i>et al</i> (13)	HIV +ve	India	2.71%	1.21%	332
Oonko <i>et al</i> (18)	HIV +ve		1.1%	-	
Sanjiv aahuja <i>et al</i> (16)	HIV +ve	India	4.9%	1.7%	-
Soner <i>et al</i> (17)	HIV +ve	India	2.2%	1.4%	-
LC Ikeako <i>et al</i> (21)	HIV +ve pregnant women	Nigeria	0.24%	0.14	1239
Hussain <i>et al</i> (15)	Patient attending STD clinic	India	0.2%	-	863

While comparing the prevalence of HIV-HBV and HIV-HCV co-infection, though the routes of transmission for all were the same, but the prevalence of co-infection varies from place to place.

The prevalence of HIV-HBV co-infection in our study is 2.5% which is nearly similar to that reported by Anurag bajaj *et al* [13] 2.71%, Tritinger *et al.* [14] 3.1%, and Hussain *et al.* [15] 0.2%. However, it is significantly lower than other reported from India as well as foreign studies. These variations may be related to the difference in the mode of transmission, which is influenced by socio-cultural practices and environmental factors, and also this could be probably because they tested other serological markers of HBV.

HBV is the second most common cause of acute viral hepatitis after HEV in India. With a 3.7% prevalence, that is over 40 million HBV carriers, India is considered to have an intermediate level of HBV endemicity. Every year, one million Indians are at risk for HBV and about 100,000 die from HBV infection [12].

In March 2015, WHO launched its first “Guidelines for the prevention, care and treatment of persons living with chronic hepatitis B infection”. In May 2016, the World Health Assembly adopted the first “Global Health Sector Strategy on Viral Hepatitis, 2016-2021”.

The prevalence of HIV-HCV co-infection is 1.26% in our study, which is nearer to Anurag Bajaj *et al* (13) 1.21%, Sanjiv ahuja *et al.* [16] 1.7% and Soner *et al.* [17] 1.4%, but very much less than other studies. However all of these few studies reported high prevalence rate, which may be because anti-HCV antibodies they also used HCV-RNA for detection of HCV infection.

The presence of anti-HCV antibodies indicates previous

exposure to hepatitis C Virus. The antibody is present in only 40% of acute infections but in more than 95% of chronic infections. The population prevalence of HCV infection in India is 1% and the estimates burden of chronic HCV infections in South Asia is 50 Million [4].

In our study, most common age, which affected by HIV infection belonged to 16-45 years (3.03%) and out of 315, 3 patients were either illiterate 0.95% or her/his schooling below primary standard (1.58%). However the overall prevalence we identified important factors that increased the likelihood of infection: low schooling, early sexual initiation and multiple sex partners.

In summary, it is positive indication there is low prevalence of Hepatitis B Virus infection. HIV, HBV and HCV are the three most common chronic viral infections seen in the world. Furthermore, vaccination against Hepatitis virus should not only be promoted among HIV infected people with negative biological marker for hepatitis B but also in the general population, in an attempt to decrease the prevalence in the general population.

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