ORIGINAL RESEARCH ARTICLE

Human Immunodeficiency Virus and Hepatitis B Virus Co-infection in a Tertiary Care Hospital From Rural Area

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Abstract:

Background:

The Hepatitis B virus (HBV) and Human immunodeficiency virus (HIV) are devastating viruses that share certain epidemiological characteristics such as risk population and transmission routes. Because of this, HIV positive individuals are at risk of co-infection with Hepatitis B virus. The reports show that co-infection by HIV/HBV causes increased morbidity and mortality as compared to HIV and HBV mono-infection.

Objectives:

The present study was undertaken to determine the prevalence of Hepatitis B virus co-infection in HIV positive patients.

Materials and Methods:

A total of 1000 clinically suspected HIV infected cases attending the Sexually transmitted disease (STD) clinic were selected. The blood samples were collected by taking all aseptic precautions. The serum samples were screened by Comb –AIDS test for HIV and confirmed as per National Aids Control Organization (NACO) guidelines and then HIV positive patients were screened for Hepatitis B surface antigen (HBsAg) marker by immunochromatographic test (Hepacard).

Results:

Out of 1000 clinically suspected cases, 348 (34.8%) were positive for HIV. Out of 348, 186(53.44%) were male and 162(46.55%) were females. Among a total of 348 HIV patients, six cases were found positive for HBsAg. Thus, HIV/HBV co-infection was detected in 1.72% cases in this study.

Conclusion:

The results indicate that the prevalence of co-infection in our area is comparatively lower as compared to other geographical areas.

Keywords:

HIV, Hepatitis B virus, Co-infection

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Introduction:

According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), about 33 million people are infected with Human Immunodeficiency Virus (HIV) worldwide and majority of them live in Asia and Africa. India has the highest HIV/AIDS prevalence in the world with an estimated 5.7 million people living with HIV/AIDS.[1] Hepatitis B is a fatal infection of liver caused by Hepatitis B Virus (HBV). Both HIV and Hepatitis B are transmitted through sexual and percutaneous routes. Thus co-infection of HIV and Hepatitis B virus is common. Hepatitis B is reported to be 50 to 100 times more infectious than HIV.[2] Both HBV and HIV are noxious viruses that share certain epidemiological characteristics such as risk population and transmission routes. Because of this HIV positive individuals are at risk of co-infection with Hepatitis B virus.[3-5] The seroprevalence for HIV and HBV co-infection ranges from 6.3% to as high as 39%.[6-8] The reports show that co-infection by HIV/HBV causes increased morbidity and mortality as compared to HIV and HBV mono-infection. The interaction between HIV and HBV is an important issue which

suggests that HIV/HBV confection has negative impact on liver disease caused by these viruses.[9-10] HIV/HBV co-infected patients are at increased risk of developing cirrhosis, having higher levels of HBV replication, having lower rates of spontaneous resolution of HBV infection and having a higher risk of activation of previous infections.[9,11,12]

Whether HBV affects HIV progression has been a matter of much debate. However there are evidences that suggest that there is faster progression of HIV to AIDS defining illness in patients co-infected with HBV.[13-14]

Center for Disease Control (CDC) and prevention recommends all HIV infected patients should be screened for HBV and those susceptible should be vaccinated accordingly.[15-17]

There are very few studies done abroad as well as in India on prevalence of HBV co-infection in HIV infected patients. Therefore, the present study was undertaken to determine the prevalence of Hepatitis B virus infection in HIV positive patients at Tertiary Care Hospital in Latur District of Maharashtra, India.

Materials and Methods:

This study was conducted in Department of Microbiology, MIMSR Medical College, Latur District, Maharashtra, India from September 2010 to June 2014.

A total of 1000 clinically suspected HIV infected cases attending the Department of Skin and Venereal Diseases (VD) were selected. The blood samples were collected by taking aseptic precautions. Five ml of venous blood samples were collected from the patients. While collecting the blood samples the arm of subject was tied with tourniquet above the elbow joint to make the veins prominent. A vein was selected and cleaned with cotton swab dipped in spirit, and then a sterile 5 ml syringe with needle was used to pierce the vein and collect 5 ml of blood which was transferred aseptically in to a sterile dry plain bottle. The blood was allowed to clot for 30 minutes and centrifuged to get serum sample.

The serum samples were screened by Comb – AIDS test- a Dot immunoassay test that employs the same principle as Enzyme Immuno Assay (EIA) in which the immobilized antigen-antibody complex is visualized by means of color producing (chromogenic) reaction. The test was performed by adding and mixing two drops of sample to each of the wells. The Comb was placed and

sample was incubated at room temperature for 10 min. The comb was rocked in between during incubation. Four drops (0.2 ml) of colloidal gold signal reagent was dispensed into each of another set of unused micro-test wells. The comb was removed and blotted on absorbent material. The comb with the tip pointing down was rocked forward and backward in the wash solution for about 10 times, and then again the tips of the arm were blotted. · The comb then was placed into well containing colloidal gold signal reagent by incubating at room temperature for 10 min. After incubation the Comb was washed again and observed for chromogenic reaction. Presence of pink colored spot in the "test" and "control" area was reported positive for HIV and confirmed as per the Strategy IIB of NACO guidelines and then HIV positive patients were screened for HBsAg marker by immunochromatographic test (Hepacard), which is a one step immunoassay based on the antigen capture, or "sandwich" principle. The test was performed by adding two drops of human serum/plasma specimen into the sample well and allowed to react for 20 minutes. Formation of pink line in test as well as control area was considered as positive.

Table No. 01 : Surveys of prevalence of HBV/HIV co-infections in the world

Author	Publication year	Country	Prevalence of HBV/HIV co- infections (%)
Present study	2014	India	1.72
Okworiet al.[18]	2013	Nigeria	11
Ekanem et al. [19]	2013	----	12.1
Muhammad hamzaet al.[20]	2013	Nigeria	12.3
FarhangBabamahmmodiet al.[21]	2012	Iran	11.3
Kaur et al.[22]	2012	India	6.34
Ankuret al.[23]	2012	India	1.7
Suresh et al.[24]	2012	India	21
Kapembwa et al. [25]	2011	Zambia	9.9
Moore et al. [26]	2010	Malawi	6.7
Di Biscegliieet al.[27]	2010	South Africa	4.8
Hussain et al.[28]	2006	India	0.2
Okothet al.[29]	2006	Kenya	15
Deborah[30]	2005	---	8.7
Otedoet al.[31]	2004	Kenya	47
Ejeleet al.[32]	2004	Nigeria	9.7
Rouetet al.[33]	2004	Coted'sIvoire	09
Mustapha et al.[34]	2004	Gombe Nigeria	26.5
Kasoloet al.[35]	2003	Zambia	31.3
Ampofoet al.[36]	2002	Nigeria	15
Sudet al.[37]	2001	Nigeria	22.2
Treitingeret al.[38]	2000	Brazia	3.1
Dimitrakopolouset al.[39]	2000	Greek	67.4
Ramanammaet al.[40]	2000	India	14.3
Lodenyoet al.[41]	2000	South Africa	06

Results:

Out of 1000 clinically suspected cases of HIV, 348 (34.8%) were positive for HIV. Out of 348, 186 (53.44%) were male and 162 (46.55%) were females. Almost all HIV positive cases were from age group 20-50 years with a negligible number of cases from the age group below 20 years and age group above 50 years. Among the total of 348 HIV positive patients, six cases (1.72%) were found positive for HBsAg. Thus, HIV/HBV co-infection was detected in 1.72% cases.

Discussion:

Though the routes of transmission are same in HIV and HBV infections, the prevalence of co-infection varies from place to place. Different prevalence rates from different geographical areas have been reported in various earlier studies.[23,28,31,35,39] In the present study, a prevalence rate of co-infection was found to be 1.72%. Although this finding of a very low prevalence rate of HBV co-infection with HIV is consistent with studies by Ankur et al.[23] and Hussain et al.[28] and fairly correlates with the findings of these studies, it appears to be very low when compared with various other studies from other countries [31,35,39] and even from other studies from India[22,24,40] who report higher prevalence rates in their studies. The very low prevalence rate of co-infection may be attributed to the differences in the study groups and prevalence of HBsAgin the community in particular geographical area. A great variation in the pattern of HBV/HIV co-infection has been reported in different studies (Table no. 1) indicating that pattern of co-infection varies from place to place.

HIV has a substantial impact on the course and the outcome of HBV disease. The rate of HBV viral clearance is decreased in HIV infected patients after an acute HBV infection. The co-infected patients progress to liver disease more rapidly with a shortened period between acquisition of infection and end stage liver disease.[42,43] The studies show that HBV reactivation and replication are enhanced in co-infected patients.[44]

The effects of HBV infection on progression of HIV disease are less clear. The finding that some HBV products, such as HBV-x protein enhance HIV replication suggesting that HBV could have an impact in HIV progression.[45] However, these findings have not been supported by clinical studies.

Conclusion:

The findings of the present study indicate that the prevalence of co-infection in our area is comparatively lower as compared to other geographical areas suggesting that the prevalence rate of co-infection can change from country to country and even from region to region in same country.

Conflict of Interest: None to declare

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