

Seroprevalence of Hepatitis B & C Co-Infection in HIV Positive Patients in a Tertiary Care Centre

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Abstract

The co-infection with Hepatitis B&C is a common problem in HIV infected patients as immune deficiency accelerates disease progression and may complicate the management of patients. The Co-infection is also associated with the reduced survival and an increases risk of progression to severe liver diseases with higher susceptibility towards hepatotoxicity due to antiretroviral therapy. The co-existence is quite permissive due to their shared modes of transmissions which are mostly through sexual contact with infected individuals, infected blood and blood products and vertical transmission. **Materials and Methods:** Serum samples were collected from HIV positive patients for detection HBsAg and anti-HCV antibodies by ELISA. **Results:** Out of 1000 HIV Seropositive patients 45 (4.5%) were positive for Hepatitis B, and 8(0.8%) were positive for HBV and HCV co-infection. **Conclusion:** Hepatitis B&C co-infection was found to be significantly higher in HIV positive individuals in comparison to normal population. Hepatitis virus infection leads to rapid progression of liver cirrhosis in HIV infected patients. Hence all HIV patients need to be routinely tested for markers of Hepatitis B&C infection may be required to monitor the clinical outcome.

Keywords: HIV, HBsAg, HCV, co-infection, transmission, anti-retroviral therapy, hepatotoxicity.

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INTRODUCTION

Human immunodeficiency virus (HIV) and Hepatitis B and C virus (HBV&HCV) are three most common chronic viral pathogens of major public health concerns. These viruses have similar routes of transmission, through blood and blood products, sharing of needles to inject drugs and sexual activity. People at high risk for HIV are also likely to be at risk for HBV or HCV enabling co-infection with these viruses. Co-infections of HBV and HCV in HIV positive patients are associated with reduced survival and an increased risk of progression to severe liver diseases with higher susceptibility towards hepatotoxicity due to antiretroviral therapy. Thus screening of all HIV positive individuals for the presence of HBV and HCV is essential for appropriate management. In developing countries like India, no such uniform guidelines are available. Moreover literature regarding the prevalence of HIV co-infection with HBV & HCV in India is sparse. Thus the present study with a large sample size, was undertaken to detect the current seroprevalence of HBV & HCV co-infection in patients

infected with HIV in and around Osmania General Hospital, Hyderabad, Telangana.

MATERIALS & METHODS

Institutional ethical committee clearance was obtained prior to the study. A total of 1000 serum samples were received from ART centre, Osmania General Hospital, Hyderabad, Telangana, from October 2017 to October 2018 for detection of HBV & HCV markers. For HBV, the marker used for routine screening was hepatitis B surface antigen (HBsAg). The test was performed using solid phase enzyme linked immunosorbent assay (ELISA) based on Direct Sandwich principle and the ELISA kit was manufactured by Accu Diagnostics Pvt. Ltd. For HCV, anti HCV (IgG) ELISA was performed using third generation ELISA test from Accu Diagnostics Pvt. Ltd. The ELISA tests were performed as per the manufacturer's instructions along with validity check and incorporation of internal controls in each run. Samples positive for HBsAg antigen &/or anti HCV antibody by first test were retested by rapid test for HbsAg and HCV IgG antibodies using chromatographic

immunoassay (Meril Diagnostics Pvt. Ltd). All borderline samples were tested in duplicate and if both duplicate retest sample absorbance value was less than the cut off value, the specimen was considered non-

reactive. If any one of the duplicate retest absorbance value was found to be equal to or greater than the cut off, the specimen was considered to be reactive for HBsAg/HCV IgG antibodies.



Figure: ELISA kits for HBsAg and HCV

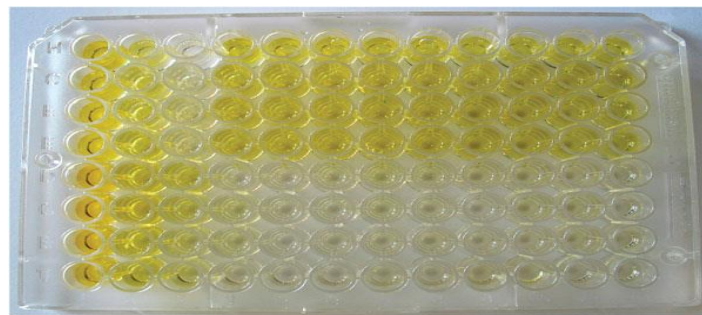


Figure: Microtitre plate showing HBsAg positives

RESULTS

A total of 1000 blood samples were received from confirmed HIV positive patients from ART clinic

over a period of 1 year. Out of these 54% (540) were male and 46% (460) were female patients. The mean age of the study group was 30-45 years.

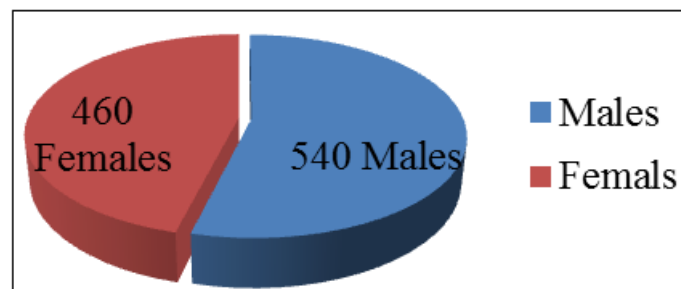


Fig: Showing number of HIV positive males and females

Table-1: Showing Number of HIV positive males and females with HBsAg and HCV co-infection

	TOTAL	MALES	FEMALES
HIV POSITIVE	1000	540	460
HIV+HBsAg POSITIVE	45	35	10
HIV+HCV POSITIVE	0	0	0
HIV+HBsAg+HCV POSITIVE	8	8	0

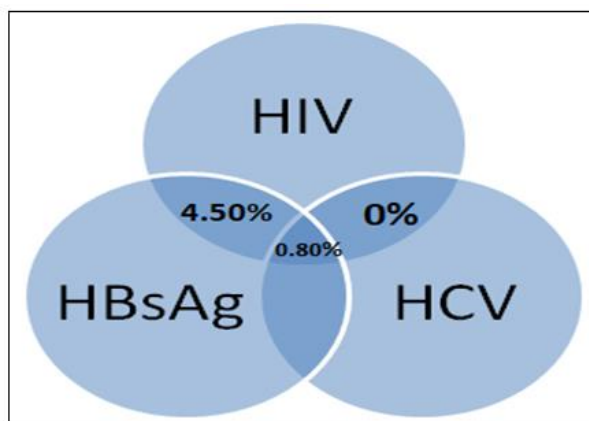


Figure: Showing co-infection with HBsAg and HCV in HIV positive patients

The prevalence of HIV positive patients co-infected with HBV was found to be 4.5% (45) and those co-infected with HCV was 0%. Co-infection of both hepatitis B and hepatitis C with HIV was found to be 0.8%. The distribution of HBV and HCV co-infection in patients infected with HIV is shown in Table-1.

DISCUSSION

HIV accounts for an estimated 40 million chronic infections while Hepatitis C and HBV cause 130 million and 370 million chronic infections respectively [2]. The prevalence of HIV in India is quite high and it ranks the second highest country in the world. Among HIV infected patients, 2-4 million are estimated to have chronic HBV infection while 4-5 million are co-infected with HCV [1, 2]. An estimated one third of deaths in HIV patients are directly or indirectly related to liver diseases [2]. Our study showed male predominance (54%) amongst HIV infected patients, which was much in concordance with other studies (73% and 86%) supporting the fact that male subjects are significantly at high risk of developing HBV/HCV co-infection [1, 3]. The mean age found in our study was 30 – 45yrs which is the normal age for HIV positivity in India [1]. This also suggest that sexual route could be the most common mode of transmission for HIV & HBV.

We found that the seroprevalence of HBV and HCV was 4.5% and 0% in HIV positive patients. This was significantly higher than the HBV and HCV seroprevalence in non HIV infected general population [4, 5]. Another study from Iran showed a much higher (14.5%) co-infection of HIV and HBV & (72%) of HIV and HCV co-infection [2]. Moreover in US and Europe, HIV/HBV coinfection has been found to be (6 to 14%) prevalence of HIV/HCV varies from (25-50%) [2]. The higher prevalence rate of HCV in HIV positive patients in comparison to the rate for HBV positivity can be considered as noticeable and it could be attributed to diverse factors particularly lack of vaccine for HCV contrary to the existence of multiple vaccines for HBV. Also sexual transmission of this virus is lower as compared to HBV and it is transmitted mostly via

injection (especially in drug addiction) because of the increasing rate of addiction in certain countries [2]. Our results were much in concordance with a South Indian study group where HBsAg was positive in (6.4%) of HIV positive patients and (2.1%) demonstrated HCV antibody [7]. Moreover, in India, a study showed that the prevalence rate of HBsAg in HIV positive patients was (3.4%) while the rate for HCV-Ab was reported to be (0%) [8]. In a similar study in northern India performed on 620 HIV-positive patients, the rate for HBV was (2.25%), for HCV (1.6%) and for both HBV/HCV coinfections it was less than (1%) [9]. Another study performed in Maharashtra which is a state with high prevalence of HIV, (25.8% and 5.6%) prevalence of HBV and HCV was found in HIV positive patients [10].

Thus different studies depict that co-infection rates of HBV & HCV in HIV patients are variable worldwide depending on geographical region, risk group and also the type of exposure. Within India only, HBV & HCV co-infection among HIV positive patients varies from one region to other as is evident from different studies. The coinfection for HBV varies from 9-30% and for HCV 2-8% [1, 10]. Moreover, the co-infection rate rises with disease progression [10]. In our study the patients were referred from ART centre and were probably in different stages of HIV disease. HIV-HBV co-infection leads to increased persistence of HBV along with increase in HBV viral load. It also leads to increased incidence of HBV reactivation and reinfection. However, liver necrosis is less due to decreased CMI in HIV positive patients. The co-infection of HCV with HIV is associated with a loss of immunological control of HCV and more rapid progression of HCV diseases [10]. HIV & HCV co-infection may lead to early onset of advanced liver diseases.

CONCLUSION

It is thus clear that apart from other infections like TB, HIV infected patients have high probability of getting HBV/HCV infection due to enhanced immunodeficiency. Shared routes of transmission also

plays significant role and is of epidemiological importance in our country. Thus routine screening of HIV infected patients for concurrent infection with HBV & HCV should be made mandatory because co-infection with these hepatitis viruses will increase the risk of cirrhosis of liver and mortalities in comparison to when a person is infected with only one of these viruses [2]. It may complicate the anti-retroviral therapy (ART) by causing increased risk of drug related hepatotoxicity. It is thus evident that screening of all HIV positive individuals for HBV & HCV co-infection should be made mandatory.

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