

Prevalence of Hepatitis B Surface Antigen (HBsAg) Among HIV Seropositive Patients

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Abstract: *Introduction:* Human Immunodeficiency Virus (HIV) and Hepatitis B virus (HBV) share the routes of transmission as a consequences infection with Hepatitis B Virus are expected to occur in HIV infected patients. The co-infection of Hepatitis B Virus (HBV) with the Human Immunodeficiency Virus (HIV) have become a major health care catastrophe as it complicates the clinical course, management and therapy for HIV infection. Hence it is important to identify them as early as possible.

Aim: The prevalence of HBV co-infection with HIV varies widely across different studies within India and outside. This study is planned to evaluate the prevalence of HIV-HBV co-infection by HBsAg screening in HIV seropositive patients in our region.

Material and Method: A total of 140 HIV seropositive patients were screened for the presence of Hepatitis B virus on the basis of the presence of HBsAg.

Result: In patients infected with HIV the prevalence of HBsAg was 7.1% (10/140) whereas in control group it was 1% (5/500).

Discussion: Our study documents fairly high rate of Hepatitis B co-infection among HIV seropositive patients suggesting that it should be mandatory to screen every HIV seropositive patient and their sexual partners for co infection with HBV and vice versa for early detection and a simultaneous treatment of hepatitis B co-infection beside HIV infection management to reduce the morbidity, delay mortality and improve quality of life in HIV-AIDS patients.

Keywords: HIV, HBsAg, HBV, Co-infection, Prevalence.

INTRODUCTION

The HIV/AIDS epidemic is one of the largest public health crisis of the 21st century, while the epidemic has spread over past two decades, a cure or vaccine for HIV remain elusive. Hepatitis B infection is one of the major public health problem globally and is tenth leading cause of death.

World wide HBV account for estimated 370 million chronic infection and HIV for an estimated 40 millions. Also among the HIV infected person 2-4 millions people have chronic HBV co-infection [1].

Patients with HIV are likely to be co infected with other viruses due to immune suppression and high risk behaviour Hepatotropic virus commonly co-infect HIV infected patients with a increased risk for Hepatitis B and Hepatitis C virus infection [2-3].

There is a high degree of epidemiological similarities between HBV and HIV interms of high risk groups, routes of transmission and presence of virus in the various body fluids [4]. The population that is at

high risk of developing HIV infection is also at high risk of developing HBV infections.

Co infection with HBV has been reported in up to 90% HIV infected patients [4-5]. In most of the patients with HIV-HBV co-infection, it is impossible to determine the relative timing of the two viral exposures. The course of Hepatitis B virus infection (HBV) is modified by presence of HIV. HIV infection has been reported to cause a higher rate of replication of hepatotropic viruses, loss of HBsAg is also at a lower rate following HIV infection as a result chronic HBV infection is more frequent in these patients as compared to general population [6-9].

Liver disease due to chronic HBV infection is becoming a leading cause of death among persons with HIV infection world wide. In a Multicentre AIDS cohort study (MACS) in 2002 [10]. It was observed that liver related mortality rates per 1000 person years of observations were 1.7 in HIV seropositive patients, 0.8 in HBsAg positive patients and 14.25 in the co-infected patients (Significantly higher as compared with mono infected patient).

The prevalence of hepatitis B co-infection varies widely across different studies. Few studies conducted in India have shown the prevalence of HBsAg in HIV

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seropositive patients varying as low as 7% to 30% [11-15].

In the post Highly Active Anti Retroviral Therapy (HAART) era life expectancy of patients with HIV has increased and the focus has now shifted to management of concurrent illness such as chronic HBV infections etc. Which have potential to increase long term morbidity and mortality. Further more co-infection with hepatitis virus may complicate delivery of anti retroviral drugs by increasing drug related toxicity and may interfere with selection of specific agent so its better to diagnose co-infection of hepatitis B in HIV at earliest possible.

In developed countries like United States guideline are formed recommending screening of all individuals infected with HIV for Hepatitis B and Hepatitis C viruses. No such guidelines are available in countries like India.

Informations regarding prevalence of HBsAg in HIV seropositive patients in our region is limited. It was against the above back drop that the present study was undertaken to determine prevalence of HBsAg in HIV seropositive patients.

MATERIAL AND METHOD

This study was conducted in the department of microbiology, R.N.T. Medical College, Udaipur, Rajasthan after an approval from institutional review committee. The study was for a period of seven months (January 2003-July 2003). Patients who registered at the OPDs or were admitted to the IPDs of this hospital, walk in patients and were found reactive to antibodies to HIV during HIV testing were included in the study group. HIV antibody detection was performed only after pretest counselling and informed consent of the patient. Reactive results of HIV antibody testing were disclosed only after post test counselling.

A 5ml venous blood sample was collected using universal precaution. Anti- HIV antibodies were detected using the commercial assay for screening and confirmation of the results. The serum was tested for Anti-HIV antibodies using ELISA test (Biotest anti-HIV TETRA ELISA) as the screening assay and test was performed and interpreted as per the manufacturer's instructions. The serum found to be reactive in the screening assay was subjected to supplementary confirmatory tests viz .rapid tests based on different antigens or different test principles (Strategy III as per

NACO guidelines). The rapid tests used were Immunocomb Bispot HIV-1&HIV-2(Organics) and Serocard™ HIV(Trinity Biotech). All the tests were performed and interpreted as per the instructions of manufacturer. A serum found to be reactive for Anti-HIV antibodies in all three ELISA/Rapid tests was considered to be positive for HIV antibodies and included in the study group. 140 HIV seropositive patients were included in the study group. The demographic and clinical profile of the patients was noted.

For Hepatitis B virus (HBV) the marker used in our laboratory for routine screening is Hepatitis B virus surface antigen (HBsAg). The test was performed using commercially available rapid immunochromatographic assay (ACON HBsAg one step test) as per manufacturers instructions. All the samples that were positive for HBsAg by Rapid immuno chromatographic assay were further confirmed by ELISA for HBsAg.

500 Antenatal Cases (ANC) were taken as control group i.e. HIV sero negative group. The ANC cases were screened for HIV and HBsAg (sentinel surveillance in Udaipur zone year 2002)

RESULT

In all 140 HIV seropositive samples were processed for HBsAg detection. All the sample were reactive to antibodies to HIV-1. None of the samples were found reactive to HIV-2 virus. In our study the prevalence of HBsAg in HIV seropositive patient was 7.1% (10/140) whereas in control group it was 1% (5/500).

In the present study when we applied chi-square test of significance. The difference was statistically significant ($P < 0.001$) which indicate that prevalence of HBsAg in HIV seropositive patients is more than general population. The study shows increased association and co infection by Hepatitis B virus in HIV seropositive patients.

134 of the 140 HIV seropositive patients gave the history of hetero sexual high risk behaviour. Of these 9 were positive for HbsAg. History of transmission was unclear in remaining of patients.

The distribution of HBV co-infection by age and gender in patients infected with HIV is as shown in Table 1.

Table 1: The Distribution of HIV-HBV Co-Infection by Age and Gender in the Study Group

Age in (Years)	HIV + HBV co infection	
	Male	Female
0-9	0	0
10-19	0	1
20-29	2	0
30-39	4	1
40-49	2	0
50-59	0	0
> 60	NIL	NIL
Total	8	2

DISCUSSION

Hepatitis B virus infection and its interaction with HIV have been discussed ever since the syndrome of acquired immunodeficiency was recognized. It is already reported that interaction between HIV and concurrent infection with hepatitis virus may alter the natural history. Clinical course and treatment response of both diseases.

In our study prevalence of HbsAg was 7.1% (10/140) and 1% (5/500) respectively in HIV seropositive patients and general population (control group). This is similar to the study carried out by Shobha Sehgal *et al.* [11], who reported 7% (15/212) prevalence of HBsAg in HIV seropositive patients.

Suwanagool *et al.* [12] reported increased prevalence of HBsAg 11.6% versus (4.7% in control group) in HIV infected patients at Bangkok indicating that the prevalence of HBV in HIV seropositive patients is more than general population.

Dhanvijay *et al.* [13] and Tankhiwale *et al.* [14] reported higher prevalence of HBsAg in HIV seropositive patients 28% and 30.9% respectively. Sud *et al.* [15] reported 33.8% HBV co-infection in HIV seropositive patients with a 7.5% prevalence of HBsAg in HIV seropositive patients. The variation found in the prevalence of HBsAg (Hepatitis B co-infection) in HIV seropositive patients across different studies are mainly due to variation in the distribution of risk factors, geographic location of study population, viral markers used in study group.

The present study is revealing heterosexual route as a major mode of transmission of HIV and HBV co-infection. This is in accordance with the study carried

out by tankhiwale *et al.* [14]. There fore it is advisable to screen for Hepatitis B virus markers in all HIV seropositive patients and there sexual partners.

In the present study the HIV-HBV co infection was higher in young sexually active age group (Table 1). This could be attributed to increased exposure of this population to risk factors like polygamy, parenteral drug abuse, lack of awareness about the disease, suggesting target interventions i.e. education, counselling and behavioural modification are required for such population along with intensification of on going control programmes.

Although HBsAg detection is common in HIV infected patients serious on chronic infection is rare and antigen positive patients usually have minimal evidence of liver disease [5]. There fore it may be considered that HIV infected individuals are at increased risk of developing chronic HBsAg carrier state rather than chronic hepatitis.

The HBV vaccine is reported to be less effective in male homosexual with HIV and response to interferon therapy is also blunted [16]. Thus it is important to recognize this high risk group which may form a reservoir of HBV infection and will cause morbidity and mortality in these patients. Furthermore co-infection with HBV may also complicate the treatment with HAART Therapy due to drug related toxicity therefore it would be beneficial to detect hepatitis B virus infection in these patients at earliest possible.

The study documents high rate of HBV co-infection in HIV seropositive patients despite using HBsAg as the only marker of HBV infection in the study group. This rate of co- infection could have been higher if

other hepatitis viral markers like HBV DNA etc.were included in the study.

A study done on 140 HIV seropositive samples can not provide overall prevalence of HBsAg in HIV seropositive patients. Nevertheless it can reflect the disease status in our zone.

With the rising incidence of HIV infection in the country and longer expected life span in these patients due to better health care facilities and availability of anti retroviral drugs the HIV-HBV co infection is a major health issue for developing countries like India.

The present study emphasize that a uniform protocol should be formed to screen every HIV/AIDS patient and their co partners for Hepatitis B viral markers and vice-versa for early detection and management of Hepatitis B co-infection beside HIV-infection management for better prognosis and survival of these patients.

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