Study of coinfection of HBV and HIV in patients attending a tertiary care teaching hospital

Ritu Vaish

Corresponding Author: Dr Ritu Vaish, MD, Assistant Professor, Department of Microbiology, Prathima Institute of Medical Sciences, Nagunur, Karimnagar District, Telangana-505417.

Email id: rituvaish27@gmail.com

ABSTRACT

Introduction : HIV positive people are frequently infected with Hepatitis B virus and total global estimate of people with co-infection is around 2 to 4 million. All people who are infected with HIV should be screened for HBV co-infection which poses a main threat for development of Cirrhosis and Hepatocellular carcinoma.

Objectives: The main objective of the current study is to assess the incidence of Hepatitis B co-infection in HIV infected patients of rural background attending a tertiary care setup.

Materials & Methods: This is a cross-sectional study done over a period of one year among the outpatients attending Prathima Hospital. Ethical clearance was taken from institutional ethical committee. Both HIV and HBsAg screening were done by using rapid immunoassay. The results were calculated by using SPSS 16 software.

Results: In our study there is no significant gender difference in the mean age of population who were infected with HIV (P=0.442). Total 16.98% of patients with HIV positive were screened positive for HBsAg indicating co-infection among the rural population attending our tertiary care center.

Conclusion: HIV infected individuals are more prone for HBV infection and are at increased risk for subsequent co-infection by Hepatitis B virus. All the HIV infected individuals and their family members should be encouraged for routine HBV screening at least half yearly. Patients with co-infection should be effectively and systematically treated with combined HBV and ART (antiretroviral therapy).

Keywords: HIV, HBV co-infection, Cirrhosis, Hepatocellular carcinoma, Antiretroviral therapy.

INTRODUCTION

Hepatitis B virus frequently infects the patients who were already infected with HIV. These patients often have a high occurrence of HBV serological markers like surface antigen (HBsAg) and core antibody (HBcAb) due to similar route of infection. When compared to the patients who were infected with HBV only, the ones who were co infected along with HIV have more HBV DNA levels and less ALT (Alanine Transferase levels).[1, 2, 3] It is estimated that co infection of HBV is seen in 5-15 % of current HIV cases and similarly 70-90% of HIV cases has history of previous HBV infection in the worldwide population.[4]

The global estimate of co-infection with both HIV and HBV is around 2–4 million individuals [5].According to the WHO, 35 million people in the world are HIV positive[6] and over 240 million people are suffering with chronic HBV infection[7]. Apart from sexual transmission HBV can be transmitted through various non-sexual routes like contact with the infected person skin lesions or by sharing of instruments that are contaminated with blood from already infected individual such as shaving razor or toothbrush etc., or from the bite of infected person or blood transfusion from the infected individual.[8]

The mortality rate due to liver damage and complications such as hepatic fibrosis, liver cirrhosis and Hepato-cellular carcinoma are much worse in HIV and HBV co infection when compared to alone HIV negative counterparts.[9,10] In the co infection of HIV and HBV, the antiretroviral therapy (ART) can be less effective and the patients have high risk of drug interactions and hepatotoxicity and are also less responsive to treatments for HBV.[11,12] Mutations leading to the drug resistance are potential threat for the combination antiviral regime leading to more complications[11,13].

All the patients infected with HBV should be tested for evidence of HIV co infection and vice versa. HIV patients should be screened mainly for the detection of HBsAg surface antigen or HBV DNA itself in the serum. The detection of hepatitis B envelope antigen (HBeAg) indicates viral replication along with HBV DNA levels. Routine ultrasound abdomen examination is advised for the Patients co infected with HIV-HBV for every six months along with Hepatocellular carcinoma screening. Even the sexual partners of the patients should undergo routine screening for every six months regularly.[14,15,16]

This current study mainly aims to study the incidence of hepatitis B virus in HIV infected patients and also assess HBsAg surface antigen seroprevalence in the HIV infected patients attending the Prathima Institute of Medical Sciences,

a tertiary care teaching hospital which demographically covers mainly the rural population attending the outpatient department.

MATERIALS AND METHODS

The ethical clearance has been obtained from institutional ethical committee. This is a cross-sectional study mainly to evaluate the co-infection of HIV and HBV in the patients attending Prathima Hospital, a tertiary care hospital mainly covering the rural population.

The sample size has been estimated from the similar previous original research studies [10,11, 12] by using open-epi software[17]. And the minimum sample size estimated with 95 % CI is 50. So the sample size for this study is 53 HIV positive cases. The demographic data like age, sex etc., were collected from the medical records of department of microbiology, central laboratory, Prathima Institute of Medical Sciences for the blood samples which came for both HIV and HBsAg screening. The HIV screening was done by using TRIDOT rapid immunoassay (J.MITRA) and the HBsAg screening was done by using HEPACARD rapid immunoassay (J.MITRA). The statistical analysis was done by using SPSS 16 software.

RESULTS

The total number of HIV positive cases are 53 with 36 males and 17 female patients. The mean age of male patients is 46.61 and female patients is 46.05 and there is significant difference between the mean of two sexes who were HIV positive (P=0.442)[Table 1]

Table 1: Age and Sex of HIV positive cases

Sex	N	AGE Mean ± Std. Deviation	t	P
Males	36	46.61±10.43	0.144	0.442
Females	17	46.05±17.30		

Out of 36 male HIV positive cases, 6 patients showed seropositivity for HBsAg antigen. Out of 17 female HIV positive cases, 3 patients showed seropositivity for HBsAg antigen. Total 9 cases of both sexes showed evidence of existing HIV and HBV co-infection among 53 infected patients [Table 2]

Table 2: Percentage of HIV positive cases with HBV co-infection

Sex	Number of HIV positive cases	Number of cases with HBV co-infection	Percentage
Male	36	6	16.66%
Female	17	3	17.64%
Total	53	9	16.98%

DISCUSSION

In our study there is no significant gender difference in the mean age of population who were infected with HIV. Total 16.98% of patients with HIV positive were screened positive for HBsAg indicating co-infection among the rural population attending the tertiary care center. 16.66 % of Males with HIV infection were screened positive for HBsAg and 17.64% of females with HIV infection were screened positive for HBsAg indicating the co-infection in both sexes. In a meta-analysis conducted by Owolabi LF et al in Nigerian population, around 15% of the HIV infected patients were suffering with HBV co-infection, the same has been observed in the current study where 16.98 % of HIV infected cases were co-infected wit HBV[10]. Similar results were seen in the studies conducted by Bùi Vu Huy et al, a total of 8.4 % of HIV positive cases were also co-infected with HBV. Both males and females were equally infected with both viruses same as in our study[18].

Patients with HBV and HIV co-infection have more immunohistochemical markers like HBeAg and HBV DNA in their blood indicating of active HBV replication when compared to patients with alone HBV infection[1]. Very high levels of Hepatitis B Virus DNA replication has been reported in homosexual men who were suffering with HIV and HBV co-infection leaving these people for increased risk of hepatic cirrhosis[2].

Risk of hepatic impairment is more common in patients suffering from HIV1-HBV co-infection especially who were having lower CD4 counts[3]. In Western Europe and United States 6 to 14% of HIV infected people are suffering with chronic HBV infection especially male homosexuals[5]. The combined antiretroviral therapy is hazardous to the liver and dosages should be adjusted according to the HBV infection[9].

Mortality and morbidity of HIV-HBV co-infection is significant in African population[11]. In a cross-sectional study conducted by Xie J et al, the HIV-HBV co-infection is highest in Central China where it is around 28.2% and in over all cases 9.5% prevalence of HIV-HBV co-infection exists across china[16].

In a meta-analysis conducted by Bagheri Amiri F et al, the prevalence of HIV and HBV co-infection is highest among the injecting drug users and also among the prisoners. They have also observed that one in three of injected drug users showed seropositivity for HBsAg and they were also more prone for HCV/HIV coinfection[19].

Early intervention with HBV-active HAART (Lamivudine/ emtricitabine and tenofovir which are effective against both HIV and HBV) will be a highly effective approach to treat the co-infection [20].

According to US Department of Health and Human Services guidelines for HIV treatment, apart from following the

safe sexual practices and avoiding of blades or needle sharing, in HIV-infected patients with >350 cells/µL CD4 cell counts HBV vaccination is the most effective treatment to prevent HBV co-infection but pre-vaccination screening of HBsAg, anti-HBs and anti-HBc should be done before commencement of vaccination[21].

The main goal of treatment of HBV in HIV infected individuals is to reduce the hepatic complications like hepato cellular carcinoma. Failing which the superimposed hepatic impairment caused by HBV deteriorates the patient's condition eventually leading to the death of patients. Discontinuing the HBV treatment reactivates the suppressed infection by HBV leading to severe hepato-cellular injury. Even response to vaccination depends on the CD4 counts of patients limiting the efficacy of HBV vaccination among patients with the co-infection[22].

CONCLUSION

HIV infected individuals are more prone and are at increased risk for HBV infection. All the HIV infected patients and their family members should be encouraged for routine HBV screening at least for every six months. They should be educated about hazards of sharing shaving kits or any potential blood stained objects between the family members and also education should be provided about protected and safe sex. HIV patients should be effectively and systematically screened for HBV infection and also combined HBV and ART (antiretroviral therapy) should be improved.

REFERENCES

1. Goldin RD, Fish DE, Hay A, Waters JA, McGarvey MJ, Main J, Thomas HC: Histological and immunohistochemical study of hepatitis B virus in human immunodeficiency virus infection. J Clin Pathol 1990, 43:203–205.
2. Colin JF, Cazals-Hatem D, Loriot MA, Martinot-Peignoux M, Pham BN, Auperin A, Degott C, Benhamou JP, Erlinger S, Valla D, Marcellin P: Influence of human immunodeficiency virus infection on chronic hepatitis B in homosexual men. Hepatology 1999, 29:1306–1310.
3. Thio CL, Seaberg EC, Skolasky R Jr, Phair J, Visscher B, Muñoz A, Thomas DL, Multicenter AIDS Cohort Study: HIV-1, hepatitis B virus, and risk of liverrelated mortality in the Multicenter Cohort Study (MACS). Lancet 2002, 360:1921–1926.
4. Piroth L, Sène D, Pol S, Goderel I, Lacombe K, Martha B, Rey D, Loustau-Ratti V, Bergmann JF, Pialoux G, Gervais A, Lascoux-Combe C, Carrat F, Cacoub P:Eidemiology, diagnosis and treatment of chronic hepatitis B in HIVinfected patients (EPIB 2005 STUDY). AIDS 2007, 21:1323–1331.
5. Alter MJ. Epidemiology of viral hepatitis and HIV co-infection. J Hepatol. 2006; 44:S6–9.
6. World Health Organization, Global Observatory Data 2013, [http://www.who.int/gho/hiv/en/]
7. World Health Organization, Hepatitis B Fact sheet revised July 2014, [http://www.who.int/mediacentre/factsheets/fs204/en/]
8. Shapiro CN. Transmission of hepatitis viruses. Ann Intern Med. 1994;120:82–4.
9. Ranjbar R, Davari A, Izadi M, Jonaidi N, Alavian SM. HIV/HBV coinfections: epidemiology, natural history, and treatment: a review article. Iran Red Crescent Med J. 2011;13(12):855–62.
10. Owolabi LF, Ibrahim A, Musa BM, Gwaram BA, Dutse AI, et al. Prevalence and burden of human immunodeficiency virus and hepatitis B virus coinfection in Nigeria: a systematic review and meta-analysis. J AIDS Clin Res. 2014;5:308.
11. Matthews PC, Geretti AM, Goulder PJ, Klenerman P. Epidemiology and impact of HIV coinfection with hepatitis B and hepatitis C viruses in sub- Saharan Africa. J Clin Virol. 2014;61(1):20–33.
12. Matthews GV, Manzini P, Hu Z, Khabo P, Maja P, Matchaba G, et al. Impact of lamivudine on HIV and hepatitis B virus-related outcomes in HIV/ hepatitis B virus individuals in a randomized clinical trial of antiretroviral therapy in southern Africa. AIDS. 2011;25:1727–35.
13. European Association for the Study of the Liver. EASL clinical practice guidelines: management of chronic hepatitis B virus infection. J Hepatol. 2012;57(1):167-185.
14. Current guidelines. AIDSinfo: Clinical Guidelines Portal. http://www.aidsinfo. nih.gov/guidelines. Updated and accessed November 6, 2014.
15. Guidelines, Version 7.02. European AIDS Clinical Society. http://www.europeanaidsclinicalsociety.org. Updated June 2014. Accessed November 6, 2014.
16. Jing Xie, Yang Han, Zhifeng Qiu, Yijia Li, Yanling Li, Xiaojing Song, et al. Prevalence of hepatitis B and C viruses in HIV-positive patients in China: a cross-sectional study. Journal of the International AIDS Society 2016, 19:206-59.
17. Dean AG, Sullivan KM, Soe MM. OpenEpi: Open Source Epidemiologic Statistics for Public Health, Version. www.OpenEpi.com, updated 2013/04/06, accessed 2015/10/09.

18. Bùi Vu Huy, Kanxay Vernavong, and Nguy?n Van Kính, "HBV and HCV Coinfection among HIV/AIDS Patients in the National Hospital of Tropical Diseases, Vietnam," AIDS Research and Treatment, vol. 2014, Article ID 581021, 5 pages, 2014. doi:10.1155/2014/581.

19. Bagheri Amiri F, Mostafavi E, Mirzazadeh A. HIV, HBV and HCV Coinfection Prevalence in Iran - A Systematic Review and Meta-Analysis. PLoS ONE 2016, 11(3): e0151946. doi:10.1371/journal. pone.0151946.

20. David M Iser and Sharon R Lewin. Future directions in the treatment of HIV–HBV coinfection. HIV Ther. 2009 July 1; 3(4): 405–415.

21. DHHS Guidelines for the Use of Antiretroviral Agents in HIV-1-infected Adults and Adolescents. AIDS info website 2013.http://aidsinfo.nih.gov/contentfiles/lvguidelines/AdultandAdolescentGL.pdf

22. Narayan Dharel and R K Sterling. Hepatitits B Virus-HIV Coinfection: forgotten but not gone. Gastroentrology & Hepatology. 2014 Dec 10(12): 780-788.

How to cite this article : Ritu Vaish. Study of coinfection of HBV and HIV in patients attending a tertiary care teaching hospital.Perspectives in Medical Research 2017;5(2):25-28.

Sources of Support: Nil, Conflict of interest: None declared.