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Co-Infection of Hepatitis C Virus and Hepatitis B Virus in Human Immuno Deficiency Virus Positive Population in Ahmedabad, Gujarat.

Medical Science

KEYWORDS : Prevalence, HCV, HBV, Co-infection

Dr. Payal Soni	3rdyear Resident, Dept. of Microbiology, B.J. Medical College, Ahmedabad
Dr. Dipa Kinariwala	Tutor, Dept. of Microbiology, B.J. Medical College, Ahmedabad
Dr. Neeta Khandelwal	Professor, Dept. of Microbiology, B.J. Medical College, Ahmedabad
Dr. Mehul Patel	3rdyear Resident, Dept. of Microbiology, B.J. Medical College, Ahmedabad
Dr. P. K. Shah	Professor, Dept. of Microbiology, B.J. Medical College, Ahmedabad
Dr. M. M. Vegad	Professor, Dept. of Microbiology, B.J. Medical College, Ahmedabad

ABSTRACT

Introduction: Co-infection of HIV positive patients with hepatitis viruses worsens the long term prognosis. The viruses has similar route of transmission, through blood and blood products, sharing of needles and sexual activity, enabling co-infection with these viruses a common event.

Methodology: A total of 718 HIV infected patients participated in study, who attended HAART clinic at B. J. Medical College, Ahmedabad during January to December 2012. ELISA (Qualisa) was used for the detection of HCV antibodies, Rapid Virucheck and ELISA (ERBALISA) was used for the detection of HBsAg.

Results: 31(4.31%) patients had antibodies to HCV and 25(3.48%) patients had antigen (HBsAg) of HBV in serum. Co-infection of HIV/HBV and HIV/HCV is more common in male aged 21-40 years. No patient had both HBV and HCV co-infection simultaneously.

Conclusion: The results indicate a low sero-prevalence of HIV/HCV and HIV/HBV co-infection, in which heterosexual transmission is the major transmission route of the virus.

Introduction:

Human immunodeficiency virus (HIV), Hepatitis B and C viruses (HBV and HCV) are the three most common chronic viral infections documented worldwide [(1)]. In patients already infected with HIV and either hepatitis B or C, the prognosis is made much worse with additional infection by other hepatotropic viruses [(2)]. HIV positive individuals are at risk of co-infection with HBV and HCV infection [(3)]. The viruses has similar route of transmission, namely through blood and blood products, sharing of needles to inject drugs and sexual activity, enabling co-infection with these viruses a common event [(4)]. With the advent of highly active antiretroviral therapy (HAART) regime capable of dramatically prolonging the survival of HIV infected patients, the impact of co-morbid infections such as HBV and HCV has come into focus [(5)]. Co-infection with HCV and HBV increases the risk for hepatotoxicity of HAART and likelihood of onset of an AIDS-defining illness, compared with infection HIV alone [(6)]. HCV or HBV co-infection in HIV positive individuals is of utmost importance due to the underlying consequences such as the hepatological problem associated with these viruses, which have been shown to decrease the life expectancy in HIV infected patients[(7)].

HIV and HBV/HCV co-infection without any evidence of chronic active hepatitis, ART should be started if CD4 count <350 cells/cu.mm. and with evidence of chronic active hepatitis, ART should be started at any CD4 count according to NACO guideline.[(8)] According to the Joint United Nations Program on HIV/AIDS (UNAIDS), about 33 million people are infected with HIV worldwide, and the majority of them live in Asia and Africa. 2.3 to 2.5 million of these are in India. Approximately 10% of the HIV-infected population has concurrent chronic hepatitis B, with coinfection more common in areas of high prevalence for both viruses[(9)]. This study was therefore carried out to estimate the prevalence of HCV and HBV seropositivity in patients living with HIV/AIDS in Ahmedabad.

Materials and Methods:

A cross sectional study was carried out at the B.J. Medical College, Ahmedabad, Gujarat, India. Only confirm positive HIV positive serum samples were included in the study. Samples were collected between January 2012 to December 2012 from HIV seropositive patients who attended HAART clinic for follow up and other health need. HIV status was confirmed by three tests (Rapid Combaids, Rapid pareekhak-Triline and Rapid pareekhak-Tridot) according to National AIDS Control Organisation (NACO) guideline.

A total of 718 HIV infected patients (426 males and 292 females) participated in this study with age range of 18-65years. Detailed clinical history along with blood samples was collected. Serum separated in vials and stored at -20°C. Epi info version 7 was used for statistical analysis at 95% confidence level.

Enzyme linked immunosorbent assay test was used for detection of antibodies to HCV in human serum following manufacturers instruction. (Qualisa, microwell enzyme immune assay for HCV, Qualpro Diagnostics, India) Positive samples were retested in duplicate and sample that reacts in either or both duplicates are considered repeatedly positive. The Qualisa –HCV had 100% sensitivity and 100% specificity. Rapid Virucheck kit was used for detection of antigen of HBV (HBsAg). Positive samples were confirmed by Enzyme linked immunosorbent assay test (ERBALISA, microwell enzyme immune assay- HBsAg) in duplicate. Rapid Virucheck –HBsAg had 100% sensitivity and 100% specificity. The Erbalisa –HBsAg had 100% sensitivity and 100% specificity.

Results:

Table (1) Age and sex distribution in study group is as follow:

Age Group (years)	Male	Female	Total
20 or less	26	28	54
21-30	134	109	243
31-40	151	84	235
41-50	67	47	114
>50	48	24	72
TOTAL	426	292	718

Out of 718 HIV infected patients, 31 (4.31%) patients had antibodies to HCV and 25(3.48%) patients had antigen (HBsAg) of HBV.

Co-infection of hepatitis C is more in male 19 (4.46%) than fe-

male 12 (4.10%) subjects. Statistical analysis showed no significant difference (p>0.05). Age group 21-30 years had the highest prevalence of HCV (32.25%). No significant difference was observed in association between age and prevalence of HCV antibodies (p>0.05).

Co-infection of hepatitis B is more in male 20 (4.69%) than female 5(1.71%) subjects. Statistical analysis showed significant difference (p<0.05). Age group 31-40 years had the highest prevalence of HBV (44%). No significant difference was observed in association between age and prevalence of HBV (p>0.05).

Table (2) Age related prevalence of HCV antibodies and HBsAg in the HIV infected patients:

Age groups (years)	HIV and HCV co-infection	HIV and HBV co-infection
< 20	4 (12.9 %)	1 (4.0 %)
21-30	10 (32.25 %)	6 (24.0 %)
31-40	8 (25.8 %)	11 (44.0 %)
41-50	8 (25.8 %)	5 (20.0 %)
>50	1 (3.22 %)	2 (8.0 %)

Table (3) Sex related prevalence of HCV antibodies and HBsAg in the HIV infected patients:

Sex	HIV and HCV co-infection	HIV and HBV co-infection
Male	19 (61.3%)	20 (80.0%)
Female	12 (38.7%)	5 (20.0%)

Most common route of transmission of HIV included in study patients is heterosexual transmission (73.26%), followed by homosexual transmission (20.48%), through blood and blood products (4.04%) and congenital transmission (2.09%). IV drug abuse was not present in any patient.

Discussion:

Chronic viral hepatitis is a leading cause of liver related death among patients with HIV/AIDS worldwide [10]. Our findings showed a prevalence of 4.31% co-infection of HCV in HIV infected patient in Ahmedabad which is lower than 8.2% reported by Agwale *et al* [12] in northern Nigeria, lower than the 11.1% reported by Forbi *et al* in Keffi[14] and somewhat in agreement with 4.8% reported by Jesses *et al* [11]in Ibadan and 5.7% reported by Inyama *et al*[17] in Jos .The factor responsible for these regional variations are unclear, although the reported co-infection rates of HCV in HIV patients have been variable worldwide depending on the geographic regions, risk groups and the types of exposure involved[13]. The results indicate a low seroprevalence of HIV/HCV coinfection in present study population, in which sexual transmission, characterized by sexual promiscuity among heterosexual individuals, is the major transmission route of the virus rather than the use of injection drugs.

Our finding shows prevalence of 3.48% co-infection of HBV in HIV infected patient in Ahmedabad which is lower than 6.2% reported by C Hawkins in Tanzania [18].

Of people with HIV in the United States, about 25% are coinfected with HCV, and about 10% are coinfected with HBV. About 80% of people with HIV who inject drugs also have HCV.HIV coinfection more than triples the risk for liver disease, liver failure, and liver-related death from HCV.

HAART has transformed HIV/AIDS from a uniformly fatal illness into a managable chronic infection and has been shown to be able to restore $CD4^+$ cells in HIV infected patients. [15] Early diagnosis of HCV in HIV individuals have not been given enough priority it deserves in Health Care delivery system possibly due to the low awareness of the burden and risk of HCV infection in HIV. The gains of HAART could be compromised by co-infection with hepatitis viruses as they are known to have adverse effects on the prognosis of HIV /hepatitis co-infection. [16]

Conclusion:

This study was able to demonstrate that co-infection of HIV/HCV and HIV/HBV is on the increase in this part of the world. The high prevalence of hepatitis virus co-infection with HIV is a cause for concern .Therefore, routine screening for hepatitis C and hepatitis B viral infections in all HIV positive patients is needed as it is now evident that early initiation of therapy before marked immunosuppression sets in could be highly beneficial for the HIV infected patients in order to decrease the long term mortality and morbidity associated with these co-infections. So routine screening of patients with HIV infection for HCV antibodies and Hepatitis B virus antigen should be encouraged.

REFERENCE

1. Soriano V, Barrieiro, P. Nunez M. Management of chronic hepatitis B and C in HIV-coinfected patients. J. Antimicrob.chemother. 2006; 57:815-818. | 2. Bonacini M., Louie S., Bzowej N., Wogl A.R., Survival in Patients with HIV infection and viral hepatitis B or C, a cohort study. AIDS. 2004;18: 2039-2046. | 3. Santiago-Munoz P., Roberts S., Sheffield J, Mcelwee B., Wended G.D. Prevalence of hepatitis B and C in pregnant women who are infected with human Immunodeficency virus. Am J. Obstr. Gyn. 2005;193 (suppl 3): 1270. | 4. McNair A.N., Main J., Thomas H.C., Interactions of the Human Immunodeficiency Virus and the hepatotropic viruses Semin Liver Disc. 1992;12:188-198 | 5. Petoumenos K., Ringland C., on behalf of the Australian HIV Observational database). Antiretroviral treatment charge among HIV, hepatitis B virus and hepatitis C virus co-infected patients in the Australian HIV observational database HIV medicine. 2005; 6:155-163. | 6. Greub G. Clinical progession, survival, and Immune recovery during antiretroviral therapy in patients with HIV-1 and hepatitis C virus co-infection. The swiss HIV cohort study. Lancet 2000;356:1800-1805. | 7. Chung R.T., Hepatitis C and B viruses. The new opportunists in HIV infection. Top HIV med. 2006;14: 78-83. | 8.Department of AIDS control, Government of India, NACO, Revised guideline on initiation of ART in adolescents and adults. | 9. Athena P. Kourtis, M.D., Ph.D., M.P.H., Marc Bulterys, M.D., Ph.D., Dale J. Hu, M.D., M.P.H., and Denise J. Jamieson, M.D., M.P.H., HIV–HBV Coinfection — A Global Challenge, N Engl J Med 2012; 366:1749-1752May 10, 2012DOI: 10.1056/NEJMp1201796 | 10. Seeley J., Grellier R., Barnett T., Gender and HIV/AIDS impact mitigation in Sub-Saharan Africa- recognizing the contraints. SAHARAJ.2004;1:87-98. | 11. Jesse A.O., Babafemi O.T., Titilola S.A., Georgina N.O., Kajoda S.A et al Prevalence of hepatitis B and C seropositive in a Nigeria cohort of HIV-infected patients. Annals of Hepatology 2008;7(2) April-June 152-156. | 12. Agwale S.M., Tanimoto L., Womack C., et al. Prevalence of HCV co-infection in HIV infected individuals in Nigeria and characterization of HCV genotype J. Clin Virol 2004; 31 suppl 1:53-6. | 13. Rochstroh J.K., Management of hepatitis B and C in HIV co-infected patients J. Acquir Immune Defic Syndr, 2003;34 suppl 1:559-565. | 14. Forbi J.C., Gabadi S., Alabi R., Iperepola H.O., Pam C.R., Entonu P. E., Agwale S.M., The role of triple infection with hepatitis B virus, hepatitis C virus and human immunodeficiency virus (HIV) type-1 on CD4+ Lymphocyte levels in highly HIV infected population of North-Central Nigeria. Mem Inst Oswaldo Cruz, Rio de Jeneiro, 2007;vol. 102(4). | 15. Rath Sun R.C., Lockhert S.M., Stephens J.R.,. HIV treatment guidelines –An overview. Curr Pharm Dis,2006; 12:1045-1063. | 16.16.25. Feld J.J., Ocama P., Ronald A The liver in HIV in Africa. Antivir. Ther. 2005;10:953-965. | 17. Inyama P.U.,Uneke C.J.,Anyanwu G.I., Njoku O.M., Idoko J.H., Idoko J.A.,Prevalence of antibodies to Hepatitis C Virus among Nigerian patiences with HIV infection.Online J.Health Allied Scs.2005 | 18. C Hawkins, B Christian, J Ye, et al. Prevalence of hepatitis B co-infection and response to antiretroviral therapy among HIV-positive patients in urban Tanzania. XIX International AIDS Conference (AIDS 2012). Washington, DC, July 22-27, 2012. |