RESEARCH PAPER | Medical Science | Volume : 3 | Issue : 4 | April 2013 | ISSN - 2249-555X

A Comparative Study on CD4 Count of Hepatitis Co-infected with Mono-infected HIV-positive Patients at a Tertiary Care Hospital in Eastern India

KEYWORDS: Co-infection, CD4 cell count, HIV/AIDS.

Dr. Rina Das	Dr. Bimal Kumar Mandal	Dr. Pulak Kumar Jana
Demonstrator, Dept of Microbiology, Calcutta National Medical College, Calcutta. India.	RMO cum Clinical Tutor, Dept of ENT & Head-Neck Surgery, Calcutta National Medical College, Calcutta, India	Demonstrator, Dept. of Community Medicine, Murshidabad MC, Berhampur. India.

ABSTRACT *Objectives: To do study on CD4 count of hepatitis co-infected and mono-infected HIV positive subjects and investigate the correlation between these two groups of HIV patients.*

Materials and Methods: A cross sectional prospective study was done between June 2010 to June 2011 at anti retroviral therapy (ART) centre in R. G. Kar Medical College and Hospital. One hundred and eighty HIV positive adults, aged 18 years and above were randomly selected and studied prospectively at the out patients department (OPD). The CD4 count of blood was done each of the hepatitis co-infected and mono-infected HIV positive subjects by BD FACS machine (D858001657) with flow cytrometry technique.

Results: The mono-infected HIV positive, HIV/HBV, HIV/ HCV, both HBV/HCV co-infected subjects were 73.89%, 20%, 5% and 1.11% respectively. The most common hepatitis co-infection detected HBV. The CD4 count increment after 6 months of HAART only HBV, only HCV, both HBV/HCV and mono-infected HIV positive calculated 84.25, 107.78, 66.5 and 99.63 cells/ul respectively and p=0.8, statistically not significant but overall mean difference 96.63 cells/ul, p<0.001 statistically highly significance.

Conclusion: The HAART therapy is highly effective and outcomes were similar for HIV/HBV, HIV/HCV and HBV/HCV co-infected patients compared with HIV only patients.

INTRODUCTION

Patients with human immunodeficiency virus (HIV) are also likely to be at risk for other infectious pathogens. Co-infection with HIV and hepatitis B virus (HBV) and /or hepatitis C virus (HCV) is common because all of these diseases are spread by similar routes of viral transmission. Of late, liver diseases due to chronic hepatitis B and C infection are becoming a leading cause of death and decrease life expectancy among persons with HIV infections worldwide [1]. There was a significant correlation between co-infection with HCV and HBV and / or both among HIV-positive patients depending on different variables including sex, age, occupation, marital status, exposure to risk factors [2]. With the advent of highly active antiretroviral therapy (HAART) regimens 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 [3]. On the other hand, viral hepatitis complicates the clinical course and management, and may also adversely affect therapy, for HIV infection [4]. Hence, in this study we investigated the initial CD4 cells count in mono-infected HIV, co-infected HIV/HBV, HIV/HCV and HBV/HCV before and after antiretroviral therapy.

MATERIALS AND METHODS

A cross-sectional prospective study was conducted between 2010 June to 2011 June on CD4 count of co-infected and mono-infected HIV patients at anti retroviral therapy (ART) centre in R. G. Kar Medical College and Hospital. One hundred and eighty HIV positive adults, aged 18 years and above were randomly selected and studied prospectively at the out patients department (OPD). All the tests were done after due patient consent and in accordance with institutional ethical guidelines. HIV was diagnosed if the sera gave positive reactions with two different tests, ELISA kit (Enz aids,Span diagnoics) and rapid test device by immunochromatographic assay (Retrocheck, Qualprodiagntic India /SD HIV, Standard diagnostic, Korea), following NACO guide line. HBV and HCV screening was carried out on all the patients just before starting the HAART. HBV screening was done with HBsAg rapid card test kit (Step cassette style HBsAg test, IND Diagnostic Inc, canada) which is an immunochromatographic based assay for the qualitative detection of Hepatitis B surface antigen in human plasma. HCV screening was done with immunochromatogrphic test kit (SD HCV, Biostandard Diagnosit Pvt. Ltd, India) which is a in vitro qualitative detection of anti-HCV antibodies in human plasma. The CD4 cells count was measured by using BD FACS machine (D858001657) with flowcytometry technique. The subjects were counseled and relevant confidentiality was maintained throughout the study. Informed consent was obtained from the patients.

Inclusion criteria for case selection:

1. Patients must be adults (18 years and above)
2. Co-infected subjects were with hepatitis B, C or B/C infected
3. Must have laboratory evidence of HIV
4. The patients must not had HAART before or suboptimum treatment

Exclusion criteria:

1. Patients having HIV with malignancy
2. Patients having HIV with opportunistic infection
3. Pregnancy with HIV
4. Severely ill patients

The details of history with special emphasis on sexual habits, marital status, IV drugs abuse and blood transfusion were noted. The CD4 count was repeated at six months interval after commencement of treatment and complete adherence to HAART by the patients. The CD4 count of the hepatitis co-infected HIV patients was compared with HIV mono-infected subjects after six months interval. Statistical analysis was done using paired T Test and ANOVA Test to evaluate any association on CD4 count of hepatitis co-infected with mono-infected HIV-positive patients. Observed differences in data were considered significant and noted in the text if $p<0.05$ was obtained.

RESULTS

In this study total 180 patients were interviewed as HIV-positive cases. Among them HBV positive, HCV positive,

Volume : 3 | Issue : 4 | April 2013 | ISSN - 2249-555X

and HBV/HCV both positives were noted 38, 11 and 2 respectively. Male and female ratio was 2.1:1 and common age groups measured 30-49 years. With the advancement of age the frequency of co-infection became low.(Table I).

In this current study mono-infected, only HBV positive, only HCV positive, both HBV/HCV positive cases were 73.89%, 20%, 5% and 1.11% respectively. The most common hepatitis co-infection detected HBV. The CD4 count differences after 6 months of HAART only HBV, only HCV, both HBV/HCV and mono-infected HIV positive patients calculated 84.25, 107.78, 66.5 and 99.63 cells/ul respectively and p=0.8, statistically not significant but overall mean difference 96.63 cells/ul, p<0.001 statistically highly significance (Table II). The statistical analysis made with SPSS 16 version software.

Table I: Table showing HIV and co-infected persons along with their mean CD4 cell count according to age groups. N=180

Age Groups (Years)	Sex		HBV (+ve) (%)	HCV (+ve) (%)	HBV & HCV (+ve) (%)	HBV & HCV (-ve) (%)	Mean CD4 count	
	Male (%)	Female (%)					Before HAART	After HAART
18 – 29	23 (12.78%)	22 (12.78%)	4 (12.78%)	2 (1.11%)	0 (0%)	39 (21.67%)	189.49	283.98
30 – 39	62 (34.44%)	26 (14.44%)	23 (12.78%)	5 (2.78%)	1 (0.56%)	61 (33.89%)	164.34	261.86
40 – 49	31 (17.22%)	7 (3.89%)	9 (5%)	2 (1.11%)	1 (0.56%)	28 (15.56%)	156.11	256.34
≥ 50	6 (3.33%)	3 (1.67%)	2 (1.11%)	2 (1.11%)	0 (0%)	5 (2.78%)	166.11	249.56
Total	122 (67.78%)	58 (32.22%)	38 (21.11%)	11 (6.11%)	2 (1.11%)	133 (73.89%)	168.98	265.61

Table II: Mean CD4 cell count increment of co-infected and mono-infected subjects after HAART. N=180

Co-Infection	Number of cases (%)	Before HAART	After HAART	Mean CD4 differences	P value
Only HBV Positive	36(20%)	174.44	258.69	84.25	0.800* <0.001**
Only HCV Positive	9(5%)	117.67	225.44	107.78	
Both HBV & HCV Positive	2(1.11%)	77.00	143.50	66.50	
Both HBV & HCV Negative	133(73.89%)	172.35	272.04	99.68	
Total	180(100%)	168.98	265.61	96.63	

*ANOVA Test: Total degree of freedom = 179; Value = 0.335; CI = 95%; p value = 0.800. **Paired T Test: t value = 13.278; Degree of freedom = 179; p value < 0.001.

There is significantly overall improvement in mean CD4 count after the HAART (Paired T Test: t value = 13.278; Degree of freedom = 179; Significance < 0.001) but the differences in improvement of mean CD4 cell count among the HIV co- infected subjects (Only HBV Positive, only HCV Positive, Both HBV & HCV Positive and Both HBV & HCV Negative) were not significant (Table IV: ANOVA Test: Total degree of freedom = 179; Value = 0.335; CI = 95%; p value > 0.05).

DISCUSSION

The co-infections constitute a major health problem in patients infected with HIV. Among these, hepatitis co-infection is the commonest and is one of the major causes of morbidity in HIV positive individuals worldwide. The treatment of co-infection is often challenging because HAART is frequently hepatotoxic, especially in the presence of co-infections. The approach to the co-infected patient is somewhat more complicated [5]. Several studies suggested co-infection with HBV or HCV had negative effects, which includes: reduced survival, association with advanced HIV clinical stage, lower CD4 cell count and more aggressive liver disease [6]. In studies of the impact of HIV on HBV infection four to tenfold increase in liver related mortality have been noted in patient with HIV and active HBV infection compared to rates in patients with either infection along [7]. In this current study CD4 cell count response dose not hamper in presence of the co-infection and the HAART therapy is highly effective. The active liver disease itself cause hazardous to the HIV positive patients treatment.

Although these co-infections can be acquired at any time during the course of HIV infection, previous reports suggest that patients co-infected with HIV/HBV/HCV appeared to have lower CD4 count values in HBV/HCV/HIV co-infected patients were poorer mean CD4 cells 107 cells/ul whereas the mean CD4 cells count for only HIV infected was 478 cells/ul [8].One study showed that the CD4 cells recoveries over time that were at least 32 cells/ul fewer than those of seronegative patients [9]. In our study CD4 count recoveries were not significantly difference but overall response in terms of CD4 increment noted highly significance. One study on 2003 found that HIV disease outcomes following first initiation of a HAART regimen were similar for HIV/HBV and HIV/HCV co-infected patients compared with HIV only patients in terms of AIDS-free survival and HIV virus during the first 12 months [10]. Similar results also obtained in our present study.

CONCLUSION

In spite of hepatitis co-infection, the CD4 count of HIV positive subjects significantly improved with HAART treatment. Hence, The HAART is highly effective treatment protocol. It is needful that screening of hepatitis co-infections to perform before commencement of HAART as co-infection itself may need treatment when it is in active stage.

REFERENCE [1] Koziel MJ, Peters MG. Viral hepatitis in HIV infection. N Engl J Med.356:1445-1454. | [2] Mohammadi M et al. Survey of both hepatitis B virus (HBsAg) and hepatitis C virus (HCV-Ab) co-infection among positive patients. Epub ahead of prints. 2009 Nov 18;6(1):202. | [3] Sulkowski MS. Viral hepatitis and HIV co-infection. J Hepatol 2008;48:353-367. | [4] Emokpae MA, Nwokedi EE, Jegede EE. Impact of Hepatitis C co-infection on CD4 cell count in HIV infected subjects. Online J Health Allied Scs. 2008;7(2):3 | [5] Irena Maier, George Y. Wu. Hepatitis C and HIV co-infection:a review. World J Gastroenterol. 2002 August 15;8((4):577-579. | [6] Thio CL. Hepatitis B and human immunodeficiency virus co-infection. J Hepatol. 2009;49:S 138-S145. | [7] Treitinger A et al. Hepatitis B and hepatitis C prevalence among blood donors and HIV-1 infected patients in Florianapolis-Brazil. Braz J Infect Dis. 2000; 4:192-6. | [8] JC Forbi et al. The role of triple infection with hepatitis B virus, hepatitis C virus, and human immunodeficiency virus type-1 on CD4+ lymphocyte levels in the highly HIV infected population of North-Central Nigeria. Mem. Inst. Oswaldo Cruz. June 2007;102(4):456-476. | [9] Andrea De Luca et al. Co-infection with Hepatitis Viruses and outcome of Initial Antiretroviral Regimens previously Navive HIV-infected Subjects. ARCH Intern Med. 2002;162:2125-2132. | [10] Lincoln D, Petoumenos K, Dore GJ. HIV/HBV and HIV/HCV co-infection , and outcomes following highly active antiretroviral therapy. HIV Med. 2003 Jul;4(3):241-9. |