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Research Article

A Clinical Study of prevalence of Hepatitis B Virus, Hepatitis C Virus and Syphilis (T. Pallidum) in HIV positive patients.

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Abstract: To study the prevalence of Hepatitis B Virus infection, Hepatitis C Virus infection and Syphilis (T. Pallidum) in HIV positive patients. This cross- sectional study was conducted on 332 HIV positive patients who presented to Dr. Baba Saheb Ambedkar Hospital ,Rohini, New Delhi from December2007 to March 2010 .The prevalence of Hepatitis B, Hepatitis C and and Syphilis in HIV positive patients in aged >15 years and their correlation with regard to history , clinical examination and laboratory parameters were studied.In our study group most of the patients were infected with HIV alone (300/332) 90.36% and the number of HIV with co-infected patients were small but significant 32/332(9.64%). The prevalence of HIV –HBV co-infection was 9/332 (2.71%), HIV –HCV co-infection was 4/332 (1.21%), HIV-Syphilis co-infection was 17/332 (5.12%) and HIV-HBV-HCV Co-infection 2/332(0.60%).The present study shows that the HIV patients may be co-infected with other infectious diseases which have mode of transmission through sexual, blood and blood products, materno-fetal route and others, thus patient may be co infected with HBV, HCV and syphilis through these common modes of transmission. The presence of such co-infection may not only affect the natural course of HIV but may also influence the clinical presentation, therapeutic response and the course of other infection also.
Keywords: HIV, Hepatitis B virus, Hepatitis C virus, Syphilis, Co-infection, Cross-sectional study.

INTRODUCTION

AIDS/HIV infection is a global pandemic, with cases reported from virtually every country [1]. HIV epidemic has remarkably impaired the economy of our country and health of its people. The major routes of transmission for HIV have been heterosexual contacts (42%), especially with commercial sex workers (CSWs), blood transfusion (15%) [2]. and intravenous drug use (15%). HIV patients may be co infected with other infectious organisms which are transmitted through common modes of transmission. In majority of the cases (>90%), mode of transmission is unsafe sexual contact. Thus patient may be co-infected with HBV, HCV and syphilis through common modes of transmission and the prevalence of HBV, HCV and syphilis co-infection in HIV patients in India is not well known. The knowledge of the magnitude of such co-infection is of great importance in making therapeutic decision while managing the patient.

There are conflicting data with respect to the impact of HBV infection on the course of HIV while some studies have shown an increased rate of HIV progression to AIDS among individual with markers of exposure to HBV [3]. and other have not shown any change in the progression of HIV disease or survival. But the natural history of hepatitis B is modified by HIV infection which has been associated with higher rates of HBV persistence (HBsAg, HBcAg detection) and relapse (re-emergence of HBsAg, HBcAg or both) [4,5]. and severity of liver disease may be related to the duration of HIV/HBV co-infection, immune status and alcohol use.

Infection with HIV has been reported to exacerbate several steps in the natural history of hepatitis C. In a study of HIV infected persons were less likely to have cleared viremia than those without HIV infection. HIV infection has been associated with higher HCV RNA viral over load and rapid progression of HCV related liver diseases. HIV positive individuals, particularly those with suppressed immune systems, are less likely to respond to vaccination against HBV and are more likely to develop chronic disease after being exposed to HBV. Moreover, individuals co-infected with HBV and HIV more frequently present with atypical serologies, have higher HBV DNA levels, and experience more profound liver disease as a result of chronic infection [6]. By contrast with HBV, sexual transmission of HCV is less efficient, though patients

with high risk sexual behaviour still have a high risk of acquiring HCV infection sexually [7]. Co-infection with HIV increases the rate of transmission of both viruses [8]. The perinatal risk of HCV transmission can be significantly reduced to<1% in infants born to HIV/HCV co-infected mothers if the mother is on ART[9]. There are estimated 5.1 million people infected with HIV with an overall estimated adult prevalence of below 1%. Hepatitis B virus carrier rate in India is approximately 3% and antibodies against hepatitis C virus are present in 1-1.5% of Indian population [10].

The manifestation of syphilis may be altered in patients with concurrent HIV infection and multiple cases of neurological relapse after standard therapy have been reported in HIV infected patients. Serologically defined treatment failure was more common among HIV infected patients than those without this co-infection [11]. There is no clear evidence that the sensitivity of serologic tests for syphilis differs in HIV infected versus HIV uninfected patients but in most HIV infected patients with syphilis, VDRL or RPR tests are reliable for both diagnosis and follow up.

The interaction of syphilis and HIV infection is reportedly complex [12]. Isolated case reports have suggested that coexistent HIV infection may alter the natural history of syphilis and the dosage or duration of treatment required to cure syphilis [13]. HIV, HBV, HCV and syphilis share certain epidemiological characteristics. In post HAART era, life expectancy of the patients have increased and the focus has now shifted to the management of concurrent illness such as chronic HBV and HCV, syphilis and other co infections which has potential to increase the long term morbidity and mortality[15].Presence of such co-infection may affect natural course of HIV whereas HIV may also influence the clinical presentation and course of other infections. The choice of antiretroviral treatment in patients with HIV disease is also influenced by the presence of co- infection. The knowledge of the magnitude of such co-infection is of great importance in making the therapeutic decision while managing the patient.

So, the present study was therefore aimed to find out the prevalence of these co-infection in HIV positive patients.

MATERIAL AND METHODS

This cross sectional study was conducted in the Dr. Baba Saheb Ambedkar Hospital ,Delhi from December 2007 to March 2010 in randomly selected HIV positive patients aged >15 years and of both sexes presenting to the hospital who were fulfilling inclusion and exclusion criteria . The prevalence of HBV, HCV and syphilis co-infection in HIV patients in India is not well known therefore, the present study is aimed to find out the prevalence of HIV, Hepatitis B, Hepatitis C and Syphilis and their co-relation with regard to history, clinical examination and laboratory parameters were studied.

Inclusion Criteria

HIV positive patients [diagnosed according to NACO criteria Age >15 years] attending medical OPD, HIV clinic or admitted in medical ward of hospital.

Exclusion criteria:

Patient who had autoimmune disease.

Patient who had malignancy.

Patients who were receiving corticosteroid or immunosuppressive treatment.

Clinical evaluation was done by taking detailed history including age, sex, occupation ,residence, personal habits and particularly following history is emphasized .

Multiple sexual partners, blood transfusion, surgical procedure, I.V. drug addiction, genital ulcer and immunization. Throughout general and systemic examination was done. Patient was particularly looked for anaemia , oral ulceration, skin rashes and lymphadenopathy.

Routine investigations such as CBC, LFT, KFT and specific investigations such as CD4 count, HIV positive report by ELISA (according to NACO criteria) , HBsAg (Anti HBCore antibody and HBeAg as and when required) for diagnosis of hepatitis B virus infection, Anti HCV antibody for the diagnosis of hepatitis C virus infection , VDRL/ RPR test for diagnosis of Syphilis (T. palladium).

The diagnostic techniques used for detection of HIV, HBV,HCV and Syphilis infection was done by following:

HIV Rapid
- COMBAIDS (Span Diagnostic Ltd)
- HIV ue (Triline) ACE Diagnostics
- ACON (Triline)

ELISA
- HIVASE 1+2 (General Biologicals Corp)
- MICROELISA (J. Mitra & Co. Pvt. Ltd.)
- GENEDIA HIV ½ ELISA 3 (Green Cross Life Science Corp.)

HBsAg
- SURASE B-96 (TBB) (General Biological Corp. Taiwan)
- DOT BLOT TECHNIQUE
- HEPAUSA (Micro well ELISA Test (j. Mitra& Co. Pvt. Ltd.)

HCV
- SP NANBASE C-96.3.0(General Biological Corp. Taiwan)

- DOT BLOT TECHNIQUE

Syphilis

- VDRL
- RAPID CARD TEST

OBSERVATIONS AND RESULTS

In our study out of 332 patients, most of the patients were infected with HIV alone 300/332 (90.36%) and the number of HIV with co infected patients were small but significant 32/332 (9.64%).

In HIV co- infected patients n=32, 9 (28.12%) were HBsAg positive, 4(12.5%) were anti- HCV positive, 17(53.13%) were VDRL positive and 2(6.25%) were both HBsAg and anti HCV positive.

The prevalence of HIV- HBV co infection was 2.71%, the prevalence of HIV- HCV co-infection were 1.21%, the prevalence of HIV – syphilis co-infection were 5.12% and the prevalence of HIV – HBV-HCV co-infection was 0.60%. In our study group, HIV infection alone or co-infection were more prevalent in male group 240/332 (72.29%) than the female group 92/332 (27.71%). But in the setting of HIV with co-infection, the prevalence rate were much more in male 23/32 (71.9%) than in females 9/32 (28.1%).

In our study, the routes of transmission for these co–infections were found to be as shown in table and heterosexual route is the most common route (Table1).

HIV infection was more prevalent in male patients (72.3%) in comparison to female patients (27.7%).In most of the cases , HIV infection was acquired by heterosexual route (84.34%) and in significant fraction of patients route of transmission was not known (7.23%)(Table1).Majority of patients belonged to age group of 20-50 years either HIV alone or HIV co-infected (Table2). The prevalence of HIV alone and co-infection was found to be maximum in the age group 21-50 years in both males (Table3) and females (Table4) .Prevalence of HIV co-infection were 9.6% and HIV alone 90.4%. The prevalence of HIV infection was more prevalent in male patients (72.28%) than in female (27.72%) (Table-3, 4). Majority of the patients were either illiterate (35.24%) or had schooling below the primary standards (37.65%) (Table5). The prevalence of HIV –Syphilis co-infection were highest (5.12%) than HIV-HBV co-infection (2.71%), HIV-HCV co infection (1.21%) and HIV-HBV-HCV co-infection (0.60%).The prevalence of HIV with co-infection were more in male (71.9%) than in female(28.1). There is variable difference in the prevalence of HIV-HBV, HIV-HCV, HIV-HBV-HCV and HIV-Syphilis co-infection in the present study and other studies. This difference may be because in these studies intravenous drug users (IDUs) and blood or blood product recipient constitute mode of transmission of these co-infections in significant study population and they also used other markers of HBV and HCV other than HBsAg and anti-HCV. In HIV-HBV and HIV syphilis co-infection the mode of transmission were heterosexual, but in HIV-HCV co-infection, significant mode of transmission were percutaneous (ie., Blood transfusion and intravenous drug users)(50.0%).

Table-1: Mode of Transmission of cases of HIV alone / HIV-HBV/ HIV-HCV/ HIV- Syphilis/HIV-HBV-HCV

Mode of Transmission	HIV alone N=300		HIV-HBV N=9		HIV-HCV N=4		HIV-Syphilis N=17		HIV-HBV-HCV N=2		Total N=332	
	No.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
Heterosexual	257	77.41	6	1.81	2	0.60	13	3.92	2	0.60	280	83.34
Homosexual Men to men	6	1.81	0	0	0	0	2	0.60	0	0	8	2.41
Intravenous drug users	4	1.20	2	0.60	1	0.30	0	0	0	0	7	2.10
Blood transfusion	10	3.01	0	0	1	0.30	1	0.30	0	0	12	3.62
Vertical transmission	1	0.30	0	0	0	0	0	0	0	0	1	0.30
Unknown	22	6.63	1	0.30	0	0	1	0.30	0	0	24	7.23
Total	300		9		4		17		2		332	

Table-2: Age wise distribution of HIV alone/HIV-HBV/HIV-HCV/HIV-Syphilis/ HIV-HBV-HCV

AGE GROUP (Years)	HIV alone N=300		HIV-HBV N=9		HIV-HCV N=4		HIV-Syphilis N=17		HIV-HBV-HCV N=2		Total N=332	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<20	5	1.51	0	0	0	0	0	0	0	0	5	1.51
21-30	98	29.52	3	0.90	2	0.60	7	2.11	2	0.60	112	33.74
31-40	111	33.43	4	1.20	1	0.30	8	2.41	0	0	124	37.35
41-50	81	24.40	1	0.30	1	0.30	2	0.60	0	0	85	25.60
51-60	4	1.20	1	0.30	0	0	0	0	0	0	5	1.50
>60	1	0.30	0	0	0	0	0	0	0	0	1	0.30
Total	300		9		4		17		2		332	

Table-3: Age wise Distribution of Male Patients of HIV alone /HIV-HBV/HIV-HCV/HIV-Syphilis/HIV-HBV-HCV

Age Groups (Years)	HIV alone N=217		HIV-HBV N=7		HIV-HCV N=3		HIV-Syphilis N=11		HIV-HBV-HCV N=2		Total (N=240)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<20	4	1.67	0	0	0	0	0	0	0	0	4	1.67
21-30	64	2.67	2	0.83	2	0.83	4	1.67	2	0.83	74	30.83
31-40	78	32.50	4	1.67	1	0.42	6	2.50	0	0	89	37.08
41-50	67	27.92	1	0.42	0	0	1	0.42	0	0	69	28.75
51-60	3	1.25	0	0	0	0	0	0	0	0	3	1.25
>61	1	0.42	0	0	0	0	0	0	0	0	1	0.42
Total	217		7		3		11		2		240	

Table-4: Age wise Distribution of Female Patients of HIV alone/HIV-HBV/HIV-HCV/HIV-Syphilis/ HIV-HBV-HCV

Age Group (Years)	HIV alone N=83		HIV-HBV N=2		HIV-HCV N=1		HIV-Syphilis N=6		Total N=92	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
<20	1	1.08	0	0	0	0	0	0	1	1.08
21-30	34	36.95	1	1.08	0	0	3	3.30	38	41.33
31-40	33	35.86	1	1.08	0	0	2	2.20	36	39.14
41-50	14	15.22	0	0	1	1.08	1	1.08	16	17.39
51-60	1	1.08	0	0	0	0	0	0	1	1.08
Total	83		2		1		6		92	

Table-5: Educational status of cases of HIV alone/ HIV-HBV/HIV-HCV/HIV-Syphilis/HIV-HBV-HCV

Education level	HIV alone N=300		HIV-HBV N=9		HIV-HCV N=4		HIV-Syphilis N=17		HIV-HBV-HCV N=2		Total N=332	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
Illiterate	109	32.83	2	0.60	1	0.30	4	1.21	1	0.30	117	35.24
Primary School	113	34.04	3	0.90	2	0.60	6	1.81	1	0.30	125	37.65
Secondary School	52	15.66	3	0.90	1	0.30	5	1.51	0	0	61	18.37
College above	26	7.83	1	0.30	0	0	2	0.60	0	0	29	8.74
Total	300		9		4		17		2		332	

DISCUSSION

In our study , out of 332 most of the patients were infected with HIV alone(90.36%) and in comparison to study group number of co-infected patients were small,(9.645).In co-infected group, 28.12% patients were HBsAg positive, 12.5% were anti- HCV positive, 53.13% were VDRL positive and 6.25% was both HBsAg and anti-HCV positive. Few of these studies, which have been done on HIV and co-infection (HBV ,HCV and syphilis) in India and foreign are shown in the table-6.

Table-6: The prevalence of HIV and co-infection in India and various other countries.

Study	Population group	Country	HIV alone %	HBV Alone %	HCV Alone %	Syphilis Alone %	HIV-HBV HBsAg +ve %	HIV-HCV Anti-HCV %	HIV Syphilis VDRL %	HIV HBV-HCV %	Size of study group
Present	HIV +ve	India	-	-	-	-	2.71	1.21	5.12	0.60	332
Dhanvijay et al[16].	Hiv+ve	India	-	-	-	-	28.0	-	-	-	175
Ahsan et al[17].	Hiv +ve	India	-	-	-	-	3.5	8.0	-	-	200
Padmapriya Darshini et al[18].	Hiv +ve	India	-	-	-	-	6.4	2.1	-	-	451
Hussain T et al[17].	Pts attending STD clinic	India	2.4	2.9	1.0	5.4	0.2	-	0.1	-	863
Mohan. et al[20].	Hiv +ve	India	-	-	-	-	-	-	12.5	-	489
Ockenga J et al[21].	Hiv +ve	Germany	-	-	-	-	9.0	23.0	-	-232	
Gesida[22]	HIV +ve	Spain	-	-	-	-	4.9	61	-	-	1260
FIPSE[22]	HIV +ve	Spain	-	-	-	-	4.8	65	-	-	1560
Santiago Munoz et al[s23]	HIV +ve Pregnant women	Texas	-	-	-	-	1.5	4.9	-	-	455
Fuse V et Al[24].	HIV+ve	Argentina	-	-	-	-	5.7	18.1	-	9.5	105
Dimitra Kopoulous A et al[24]	HIV+ve	Greece	-	-	-	-	67.0	13.8	-	-	181
D Lincolin et al[26].	HIV+ve	Australia	-	-	-	-	6.3	13.1	-	-	2086
Rouet F et al[27].	HIV +ve	West Africa	-	-	-	-	9.0	1.2	-	-	501
Saillour F et al[28].	HIV+ve	Aquitains	-	-	-	-	6.9	42.5	-	-	1935
Treitinger et al[29].	Blood donor and HIV infected	Brazil	-	-	-	-	3.1	51.7	-	-95	
Mahajan A.et al[30].	HIV Positive	India	-	-	-	-	3.4	0	4.34	-	230

While comparing the prevalence of HIV-HBV, HIV-HCV and HIV-Syphilis co-infection, though the routes of transmission for all were the same, but the prevalence of co-infection varies from place to place.

The prevalence of HIV-HBV coinfection in our study is 2.71% which is nearly similar to that reported by Ahsan et al [17]. 3.5%, Treitinger et al[29]. 3.1% and Santiago-Munoz et al. 1.5%. However, it is significantly lower ($p<0.001$) than other reported from India as well as foreign studies. This difference may be due to the difference in the study group and the prevalence of HBsAg in communities of that geographical area .Few studies have reported a very high prevalence of HIV-HBV co-infection, this could be probably because they tested HBV infection not only detecting HBsAg only but also other markers of HBV infection (anti-HBe, HBV –DNA and HBeAg).

The prevalence of HIV-HCV co-infection is 1.21% in our study, which is nearer to Rouet F et al[27]. study (1.2%), but very much less than other studies ($p<0.001$). However, all of these studies have reported high prevalence rate, which may be because besides anti-HCV antibodies they also used HCV-RNA for detection of HCV infection.

HCV infection in the absence of sero-positivity can occur in immunocompromised HIV patient but is less common than in other immunocompromised hosts. Approximately 1/3 of anti –HCV positive patients have normal serum ALT levels. But on liver biopsy, most of these patients have some degree of histological proven chronic liver damage, ranging from mild chronic hepatitis to cirrhosis.

The prevalence of HIV-Syphilis co –infection in our study is 5.12% (17/32) which is nearly similar to Mahajan et al [30]. (4.34%) but higher than 0.1% of HIV –Syphilis co-infection studied by Hussain et al [19]. but very much less than 12.5% of HIV –syphilis co-infection by Mohan et al[20]. These differences may be because of geographical epidemiology and different study groups.

In our study , the most common mode of transmission of either HIV disease alone or with co-infection were unsafe heterosexual contacts (84.34%) and in significant number of cases the exact route of transmission could not be confirmed (7.23%). In HIV alone cases the most common mode of transmission was heterosexual contacts (77.41%) followed by unknown etiology (as per patients history) 6.63%, homosexual contacts (1.81%)., I.V. drug abusers (1.2%) ,then vertical transmission(0.3%).In HIV-HBV and HIV- syphilis co-infection the heterosexual contacts were the main route of transmission but in HIV-HCV co infection , in significant number of cases infection acquired through percutaneous route (50%) and in rest of cases heterosexual contact is the route of transmission. This data was more or less similar to data published in other studies and NACO reports.

In our study, most common age, which affected by HIV infection belonged to 21-50 years (96.69%). In case of HIV with co-infection (HBV, HCV AND Syphilis) more than 80% of cases belonged to21-40 years of age group this data is also similar to other studies and NACO reports .In our study out of 332, 117 patients were either illiterate 35.24% or her/his schooling below primary standard (37.65%).In case of HIV with co- infections 20/32 also belonged to above group. This data also matches the data published by other studies and NACO reports.

There is difference in the prevalence of HIV-HBV, HIV-HCV, HIV-HBV-HCV and HIV –Syphilis co-infection in the present and other studies. This difference may be mainly due to different subsets of population studies. The higher prevalence of co-infections was particularly shown in IUDs. Whereas most of the patients in the present study were infected through heterosexual route.

Higher prevalence of co-infection studied from abroad may also be due to more sensitive test used to detect co-infection with HBV/HCV/Syphilis.

CONCLUSION

It is a positive indication that there is a low prevalence of HBV, HCV, and Syphilis co-infection in Indian patients from north. This will not hamper" National ART Roll Up Programme" aimed at providing ARV drugs to maximum number of needy patients since complicating factors like co-infections are very low in prevalence. On the other hand, all attempt should be made to ensure that HIV infected patients follow safe sex precautions (condoms) and the provision of safe blood transfusion in order not to have co-infection

HIV, HBV, and HCV are the three most common chronic viral infections seen in the world. All three viruses and syphilis share common modes of transmission and hence co-exist in the same host at significantly high rates. HIV-induced immunosupression has deleterious effects on the natural history, pathophysiology, diagnosis, therapeutic responses to hepatitis viruses. Co-infection with the hepatitis viruses, syphilis and HIV is likely to become a major health care catastrophe in the coming years.

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