

Research Article

Seroprevalence of hepatitis B virus and hepatitis C virus co-infection in human immunodeficiency virus infected patients at a tertiary care hospital in South India

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ABSTRACT

Background: About one third of human immunodeficiency virus (HIV) infected patients are co infected with either hepatitis B virus (HBV) or hepatitis C virus (HCV) as the three viruses have similar routes of transmission that is through transfusion of blood and blood products, sharing of needles to inject drugs and unprotected sexual activity. The survival of HIV infected patients has been markedly improved with highly active antiretroviral therapy (HAART). However several studies showed that the liver diseases caused by HBV or HCV have emerged as one of the leading causes of non AIDS related deaths in HIV patients. The objective of this work was to study the prevalence of HBV & HCV co-infection in HIV infected patients at a Tertiary care centre in South India.

Methods: The study group includes 100 HIV seropositive individuals confirmed by three rapid tests as per NACO (National AIDS Control Organization) guidelines in ICTC (Integrated Counseling and Testing Centre), Department of Microbiology, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India. Age and sex matched 100 HIV seronegative individuals were also included in the study as controls. Both the groups were screened for detection of HBV and HCV markers by one rapid test and a solid phase enzyme linked immunosorbent assay (sandwich ELISA).

Results: Out of 100 HIV positive patients in the study group 12(12%) were co infected with HBV and 2(2%) were co infected with HCV. Out of 12 HIV and HBV co infected patients 7(58.3%) were females and 5(41.7%) were males. The HIV &HCV co infected patients were both females. Co infection of HBV & HCV with HIV was found to be 0(0%). Co infection was most commonly seen in the age group 31-40 years followed by 21 – 39 years. In the control group out of 100 HIV negative individuals, 1(1%) was infected with HBV infection.

Conclusions: The routine screening of HBV and HCV should be mandatory for HIV infected patients, as there is more chance of co infection with these Hepatitis viruses due to enhanced immunodeficiency by HIV and similar routes of transmission. Clear National policies should be established which should include clear economic and health care strategies to improve quality of living conditions, education and easy access to health care facilities.

Keywords: Human immunodeficiency virus, Co-infection, Hepatitis B virus, Hepatitis C Virus, Seroprevalence

INTRODUCTION

About one third of HIV (Human immunodeficiency virus) infected patients are co infected with either HBV

(Hepatitis B Virus) or HCV (Hepatitis C Virus) as the three viruses have similar routes of transmission that is through the transfusion of blood and blood products, sharing of needles to inject drugs and unprotected sexual activity.¹⁻⁵

Co infection of HBV & HCV in HIV positive patients are associated with reduced survival and an increased rise of progression to severe liver diseases with higher susceptibility towards hepato-toxicity due to antiretroviral therapy.^{2,6}

In co infection, the presence of one virus impacts the natural history of the other virus. HIV accelerates the natural course of HBV and HCV infection and facilitates faster progression of liver disease to cirrhosis and hepatocellular carcinoma.⁷

The survival of HIV infected patients has markedly improved since the introduction of highly active antiretroviral therapy (HAART) and deaths from AIDS (acquired immunodeficiency syndrome) related causes have declined.^{8,9} However, several studies have shown that the liver diseases caused by HBV and HCV co infection have emerged as one of the leading causes of non AIDS related deaths in HIV patients.¹⁰⁻¹²

Several studies have shown that HIV- HBV and HIV - HCV co infected patients are at increased risk of disease progression to cirrhosis, which is almost three times faster when compared to HIV negative patients.^{9,13,14} Universal screening of Hepatitis B and C in HIV infected patients is highly recommended for therapy.

The present study was under taken with the objective to observe the presence of HBV and HCV co infection in HIV infected patients at a tertiary care center in South India.

METHODS

The study was done in the Department of Microbiology, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India. The study group includes 100 seropositive individuals whose HIV status was confirmed by three rapid tests as per NACO (National AIDS Control Organization) guidelines in the ICTC (Integrated counseling and testing center) Department of Microbiology. Age and sex matched 100 HIV seronegative individuals were included in the study as control group. The study group and control group were screened for detection of HBV and HCV markers. The marker used for screening of HBV was Hepatitis B surface antigen (HBsAg) and was detected by one rapid test and a solid phase enzyme linked immunosorbent assay (ELISA), which was based on direct sandwich principle (HEPALISA- manufactured by J. Mithra and co Pvt Ltd) . For HCV, one rapid test and anti HCV (IgG) ELISA was done using 3rd generation ELISA kit (HCV Microelisa by J. Mithra and co pvt Ltd). ELISA test was done as per the manufacturer's instructions along with validity check and incorporation of internal controls in each run.

RESULTS

The most commonly affected age group was 31-40yrs and 58% were males. The predominant mode of

transmission of HIV was sexual contact with multiple partners 88% (Heterosexual). Spouse positivity was observed in 17%, Female sex workers were 10% and IV drug abuse in 2%. Most of the patients were from urban areas (72%). 50% were illiterates and 57% were Daily workers by occupation (Table 1).

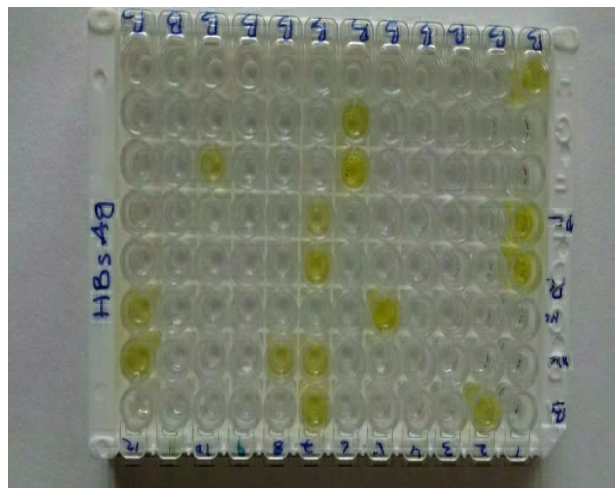


Figure 1: ELISA test for HBs Ag showing the results.



Figure 2: ELISA test for anti HCV Abs showing results.

Out of the 100 HIV positive patients, 12 (12%) were co infected with HBV and 2(2%) were co infected with HCV. Out of 12 HIV and HBV co infected patients 7 (58.3%) were females and 5 (41.7%) were males. The HIV patients co infected with HCV were 2 (2%) and both were females. Co infection was most commonly seen in age group 31-40yrs followed by 21-30 yrs. Co infection of HBV and HCV with HIV (triple infection) was found to be 0 (0%). The distribution of HBV and HCV co infection in patients infected with HIV is shown in Table 2.

In the control group out of 100 HIV negative individuals, 1 (1%) was infected with HBV and none of the controls were infected with HCV.

Table 1: Socio demographic characters of HIV infected patients n=100.

Characters	Number	Percentage
Gender		
Male	58	58 %
Female	42	42%
Age (years)		
10 – 20 yrs.	2	2%
21 – 30 yrs.	24	24%
31 – 40 yrs.	48	48%
41 – 50 yrs.	16	16%
51 – 60 yrs.	7	7%
61 – 70 yrs.	3	3%
Marital status		
Married	90	90%
Unmarried	9	9 %
Widow	1	1 %
Behaviour		
Multiple partners	88	88%
Female sex workers	10	10%
Drug abuse	2	2%
Occupation		
Daily workers	57	57%
Employees	18	18%
Business	10	10%
Beggars	4	4%
Students	11	11%
Educational status		
Illiterates	50	50%
Primary education	30	30%
10 th std	8	8%
Degree	12	12%
Residence		
Urban	72	72%
Rural	27	27%
Tribal	1	1%

Table 2: Prevalence of HBV and HCV co infection in HIV seropositive patients.

Age in yrs.	HIV +ve		HIV + HBV		HIV + HCV		HIV+HBV +HCV	
	Male	Female	Male	Female	Male	Female	Male	Female
10-20yrs	2	0	0	0	0	0	0	0
21- 30 yrs.	12	12	2	2	0	0	0	0
31- 40 yrs.	25	23	3	4	0	2	0	0
41- 50 yrs.	11	5	0	1	0	0	0	0
51- 60 yr.	5	2	0	0	0	0	0	0
61- 70 yrs.	3	0	0	0	0	0	0	0
Total	58	42	5	7	0	2	0	0

DISCUSSION

HIV accounts for an estimated 2.1 million people in India and occupies 3rd highest position in the world.¹⁵ HIV prevalence in India varies geographically. The highest number of people living with HIV is in Andhra Pradesh,

Karnataka, Maharashtra and Tamilnadu in the south accounting for 53% of all HIV cases.¹⁶ However, HIV prevalence is falling in these states and the number of new HIV infections is rising in some states of the North and Northeast India.

An estimated one third of deaths in HIV patients are directly or indirectly related to liver diseases.⁶ Our study showed male predominance (58%) amongst HIV infected patients which correlated with studies of Sanjiv Ahuja et al. (62%)² and other studies (73% and 86%) which are higher than in our study.^{1,17} Co-infection with HBV and HCV (58.3% and 100% respectively) was predominant in HIV positive females in our study which correlates with the studies of Oslanisun Olefemi Adewole et al.¹⁸ from Nigeria.

The most common age found in our study was 21-40 years which is the normal age for HIV positivity in India and correlates with Naval Chandra et al.⁷, Sanjiv Ahuja et al.² and Oslanisun Olefemi Adewole et al.¹⁸ The predominant mode of transmission of HIV was multiple sexual partners (88%) which correlates with Oslanisun Olefemi Adewole et al. who reported 78%.¹⁸

The socioeconomic factors observed in our study were correlated with Solange Zacaluni FREITAS et al.¹², Saulo Martins et al.¹⁹, Mohamed A. Daw et al.²⁰⁻²³

In our study the co-infection of HIV with HBV was 12% which correlates with Oslanisun, Olefemi, Adewole et al.¹⁸ who reported 11.5%, and Naval Chandra et al.⁷ who reported 15%, whereas it varied in various studies from India showing 30.4% from Nagpur²⁴, 2.25% from Lucknow²⁵, 7.7% from Chennai²⁶ and 3.5% from Mumbai.²⁷

The HCV co-infection in the present study was 2% which correlates with Oslanisun, Olefemi, Adewole et al.¹⁸ who reported 2.3% and 2.3% in Chennai²⁶, 1.6% in Lucknow²⁵, whereas higher in Nagpur 7.2%²⁴, 8% from Mumbai²⁷ and 8.3% from Hyderabad.⁷

In the control group, prevalence of HBV infection was 1% in our study which correlates with Naval Chandra et al.⁷ who reported 1.6%. None of the healthy controls were positive for HCV infection which correlates with Naval Chandra et al.⁷

CONCLUSIONS

The routine screening of HBV and HCV should be mandatory for HIV infected patients, as there is more chance of co-infection with these Hepatitis viruses due to enhanced immunodeficiency by HIV and similar routes of transmission.

Co-infection with these Hepatitis viruses increase the risk of cirrhosis, hepatocellular carcinoma and mortalities and also complicate the drug management with ART and drug related hepatotoxicity.

Clear national policies should be established which should include clear economic and health care strategies to improve quality of living conditions, education and easy access to health care facilities.

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