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Original Research Article

A Cross Sectional Study of the Co-Infection of Hepatitis B and Hepatitis C Virus among HIV Seropositive Patients

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ABSTRACT

Human immunodeficiency virus (HIV) with the co-infection of Hepatitis B virus (HBV) and Hepatitis C virus (HCV) has emerged as a serious global public health problem. The co-infection not only accelerates the HIV progression but also creates complication in treating patients with HIV. Although there are studies on seroprevalence of HIV, HBV and HCV, similar study is lacking in Mysuru city. The aim of the present study was to estimate the hospital based seroprevalence of HBV and HCV among HIV seropositive patients.

Key words: Human immunodeficiency virus, Hepatitis B virus, Hepatitis C virus, Hospital based seroprevalence, co-infection.

INTRODUCTION

Human immunodeficiency virus (HIV), hepatitis B virus (HBV) and Hepatitis C virus (HCV) co-infection has emerged as a leading cause of morbidity throughout the world in the last two decades. [1,2] These three are most common chronic viral pathogens of major public health concerns. [3,4] All the three viruses have similar routes of transmission like blood and blood products, sharing of needles and sexual activity. [3] At least one-third of the world's population has been infected with HBV which is approximately 2 billion and among them, it is estimated that 360 million people are chronic carriers. The global epidemiology of HBV is best reviewed according to the six regions defined by the World Health **Organization (WHO):** the Americas, Europe, Africa, Eastern Mediterranean, South-East Asia, and the Western Pacific. In South-East Asia, India has been placed into intermediate zone of prevalence of hepatitis by WHO with a prevalence of 1.46% for HBV. [5] On the other hand, HCV infection is around 2%; with 170 million persons chronically infected with the virus and around 3 – 4 million persons newly infected each year. [6] It is now widely recognized as one of the common etiological agents for cirrhosis of the liver. The presence of anti hepatitis C virus antibody (anti-HCV Ab) indicates previous exposure to HCV. In India, according to an estimate, approximately 15 million people have antibodies against HCV. [7]

It was estimated that globally there are 34 million people living with HIV/AIDS at the end of 2011. [8] With the reduction in death due to highly active anti retro viral therapy (HAART), deaths due to HBV and HCV infection is on rise in

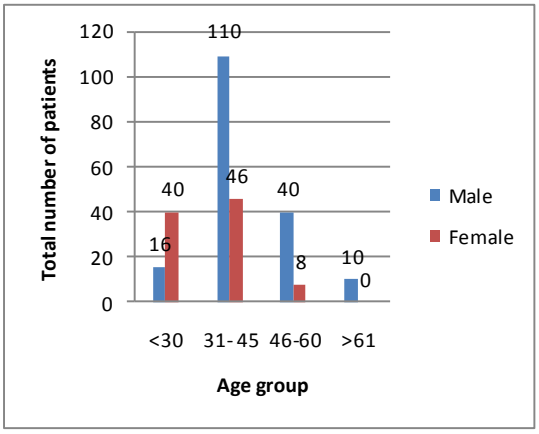
HIV positive patients. In the era of HIV, these three viruses exist as a co infection and pose a great challenge in reducing the co-morbidity to healthcare all over the world. The present study was carried to detect the hospital based sero prevalence of HBV and HCV among HIV positive population in Mysuru.

MATERIALS AND METHODS

The study was carried in Department of Microbiology, JSS Medical College and Hospital, Mysuru for a period of 15 months. Blood samples of all the patients who consented to participate in the study were taken for HIV test; confirmation for the same was done as per NACO guidelines. Patients who were positive for HIV were only included in the study. 5 ml of venous blood was collected from all the patients. The sample was allowed to clot and serum was collected after centrifugation. All the patients' sample were tested for HIV antibodies using immunochromatographic test (SD Biolines, Biostandards), HIV Trispot (AIDS scan, Bhat Biotech), Dot Immuno assay (Combs AIDS, Span Diagnostics). All the samples which came positive by any of the two methods for HIV were further processed for HBsAg and HCV testing. IgG antibody to HCV was tested by NANBASE C - 96 (General Biologicals Corporation, Taiwan) using ELISA method. HBsAg was determined using SURASE B 96, (General Biologicals Corporation, Tiwan) using ELISA method. All the positive samples were run by the same kit as mentioned above for reconfirmation.

RESULTS

In the present study, 270 subjects were included and all the samples were processed for HBsAg and HCV antibodies detection. The Age, Sex, Occupation and Literacy status of the hospital based population infected with HBV, HCV and HIV were analysed. The seroprevalence of HBsAg was 2.22% and the seroprevalence of HCV was 0.74% in HIV seropositive subjects. (Table 1) The maximum numbers of subjects were in the age of 31-45 years and the least were in the age of > 61 years. (Graph 1) It was also noted that most of the subjects involved in the study were illiterate (31%) followed by primary school level education (30.3%). (Table 2) This group (61.5%) had no knowledge of HIV, HBV, HCV virus or their mode of transmission or infection. It was also found that all the HBsAg positive cases were observed in SSLC/PUC going students, for which we are unable to find out any reason. We also observed that 5% of the total subjects involved in the study were separated which may be because of the HIV status of the patient. Only 8% of the subjects involved in the study were single. (Table 3) The male: female ratio of our study was 1:1.87. There were more number of females who were HBsAg seropositive than males whereas the number of males and females was equal for HCV seropositivity. (Table 4) Post test counseling was done for them in order to stop the spread of HIV, HBV and HCV.



Graph 1: Division of male and female in different age groups

Table 1: Seroprevalence of HBsAg and HCV among different age group with percentage in parenthesis

Age (in years)	Total HBsAg positive cases	Total HCV positive cases
>30	0	0
31-45	6	1
46-60	0	1
>61	0	0
TOTAL	**6 (2.22%)**	**2 (0.74%)**

Table 2: Age and literacy rate distribution of hospital based population

Age (in years)	Illiterate	School	SSLC/ PUC	Diploma	College
>30	6	12	26	2	10
31-45	54	52	40	2	8
46-60	18	16	12	0	2
>61	6	2	0	0	2
TOTAL	**84**	**82**	**78**	**4**	**22**

Table 3: Age and marital rate distribution of hospital based population

Age	Single	Married	Separated	Widow
>30	2	42	0	2
31-45	16	120	6	14
46-60	4	34	6	4
>61	0	10	2	8
TOTAL	**22**	**206**	**14**	**28**

Table 4: Age and sex distribution of hospital based population with Hepatitis B and Hepatitis C seropositivity

Age	No of males tested	No of female tested	No of males with HBsAg detected	No of females with HBsAg detected	Total HBsAg positive cases	No of males with HCV detected	No of females with HCV detected	Total HCV positive cases
>30	16	40	0	0	0	0	0	0
31-45	110	46	4	0	4	1	0	1
46-60	40	8	0	2	2	0	1	1
>61	10	0	0	0	0	0	0	0
TOTAL	**176**	**94**	**4**	**2**	**6**	**1**	**1**	**1**

DISCUSSION

The HBV and HCV seroprevalence was evaluated among HIV seropositive patients. We found the seroprevalence of HBsAg to be 2.22%, which is similar to the study by CP Bhatia et al. [9] in which the seroprevalence of HBsAg was found to be 2.5%, while the seroprevalence of patients attending the surgical OPD in Rawalpindi in Pakistan has been reported to be 2.28%. [10] The study by Lodha et al. [11] on HBV epidemiology in HIV positive patients has suggested that the true prevalence rate in India is 1 – 2 %. There is a variation of prevalence from country to country. In the present study, the seroprevalence of HBV among males was 2.27% while among females was 2.14%, which is slightly more than the study by Smita Sood [12] where the prevalence was 1.04% and 0.58% among males and females respectively. The seroprevalence of HCV in the present study was found to be 0.74% which was higher than the studies reported in India by Sood et al. (0.28%) [12] but much lower than the study reported by Mishra S et al. (1.57)%, [13] Bhattacharya S et al. (4.8 %), [14] Sharma et al. (1.7%) [15] and Baheti R et al. (2.46%). [7] Globally, the prevalence of HCV has been reported to be 9%, [16] 5.95, [17] and 6% [18] from Pakistan, Ethiopia and Mauritius respectively. In the present study, two seropositive cases of HCV were there which were in the age group of 31-60 years, with one being male and other being female. Out of 270 patients, only one patient (female) was found to be co-infected with HIV, HBV and HCV with the seroprevalence rate of 0.37%.

CONCLUSION

This is the first of its study defining the rate of infection of blood borne viral pathogen among hospital based study in Mysuru, South India. We observed that there is decrease in the prevalence rate of HCV and HBV among

hospital based population. More of such studies among HIV positive patients is encouraged so that we can decrease the morbidity and mortality of these patients.

Ethical approval: Approved by Institutional Ethical Committee

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