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RESEARCH ARTICLE

SEROPREVALENCE OF HCV IN HIV INFECTED PATIENTS: A STUDY FROM TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction: There is a high degree of similarity between Human Immunodeficiency Virus (HIV) and Hepatitis C Virus (HCV) in terms of routes of transmission, associated risk factors and their presence in the body fluids. Thus the co-infection of these two viruses is a common phenomenon. HIV accelerates the natural course of HCV infection and facilitates faster progression of liver disease to cirrhosis and heap tocellular carcinoma. Co-infection of HCV with HIV infection results into substantial impairment of cell mediated responses, faster progression of HIV to AIDS-defining illness. Progression of liver related pathogenicity in HIV-HCV co-infection leads to increased risk of drug related hepatotoxicity when Anti-retroviral Therapy (ART) is initiated in these patients.

Material and Methods: A study was carried out in a tertiary care Hospital to determine the sero-prevalence of HIV-HCV co-infection. 200 randomly selected newly diagnosed HIV patients were enrolled. From each of the patient, 3-5 cc venous blood was collected and Anti-HCV by ELISA was performed on obtained serum samples. Recent CD4 T cell count, Liver function Tests and WHO staging of the co-infected patients was noted.

Results: A single HIV-HCV co-infected case was found with its sero-prevalence of 0.5%. The co-infected case had lower CD4 T-cell count, deranged ALT level and presented with WHO clinical stage-II.

Summary and Conclusions: We recommend screening of all HIV positive patients for Anti-HCV to know HIV-HCV co-infection. In HIV-HCV co-infected cases, liver function tests, CD4 T-cell count and WHO clinical staging should be regularly monitored.

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INTRODUCTION

Human Immunodeficiency Virus (HIV) is one of the greatest challenges of the medical world today. The transmission through blood is still one of the most common routes for spread of HIV. This route is also shared by Hepatitis C viruses (HCV) (Rockstroh, 2003) Therefore individuals at risk of HIV are concomitantly at risk of acquiring hepatitis C viral infection (Kumar *et al*., ?). In India, the prevalence of co-infection of HIV-HCV vary from 2-8% (Kaur *et al*., 2012; Tankhiwale *et al*., 2003). Life expectancy of HIV patients has increased With improved treatment. Due to this liver disease has become an important cause of morbidity and mortality in HIV infected patients (Kaur *et al*., 2012; Zhou *et al*., 2007). HIV infection has a deleterious effect on the outcome of patients with chronic viral hepatitis due to HCV and greatly complicates their management. HIV positive individuals with chronic hepatitis due to HCV have greater liver mortality than those infected with HIV alone (Tankhiwale *et al*., 2003).

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HIV promotes chronicity of infection, liver fibrosis and increases the risk of hepatocellular carcinoma in chronic hepatitis C, especially when CD4 T cell counts are low (Wondimeneh *et al*., 2013). Co-infection of hepatotropic virus such as HCV with HIV infection results into substantial impairment of cell mediated responses and enhances the mechanisms of viral replications. This results in considerable decrease of CD4 T cell count in HIV-HCV co-infected patients (Anbazhagan *et al*., 2010). There is a faster progression of HIV to AIDS-defining illness when HIV is co-infected with HCV (Adewole *et al*., 2009). Furthermore, co-infection with HCV can complicate the antiretroviral treatment of HIV. It also accelerates the progression of liver related pathogenicity. This leads to increased risk of drug related hepatotoxicity when ART is initiated in these patients (Premalatha *et al*., 2014). With this background, the present study was particularly focused on Co-infection of HCV in newly diagnosed HIV infected patients. The cases enrolled in the study were HIV Infected adults which were not on Antiretroviral Therapy. The study also throws light on the fact whether HIV-HCV co-infected cases had less CD4 count and

more deranged levels of Liver Function Tests (LFT) than HIV mono-infected cases. Another important aspect of this study is to look for combined effect of HIV-HBV on WHO staging of HIV.

METHODS AND MATERIALS

A Prospective, observational type of study was carried out in adult HIV infected patients attending to Integrated Testing and Counseling Centre (ICTC) of a tertiary care hospital over a period of two years. A total of 200 newly diagnosed HIV infected cases not on ART were enrolled in the study after approval of Institutional Ethical Committee. HIV positive cases that were diagnosed with other opportunistic infections were excluded from the present study. Written informed consent was taken from every participant. From each of the enrolled patient, 5 ml venous blood was collected in the plain vacutainer. The clear serum obtained after centrifugation was then stored at -20°C till the serological tests was performed. All the serum samples were further processed to detect Anti-HCV by ELISA (Qualisa™ – Qualipro diagnostics) as per the manufacturer's kit instructions. HIV positive patients who were Anti-HCV positive were considered as HIV-HCV co-infected. Recent CD4+ T cell count of all patients at the time of blood collection was noted. Liver function tests consisting of serum bilirubin, AST, ALT, ALP were recorded. Data was statistically analyzed using Microsoft Excel and SPSS 21.0 software. Appropriate statistical tests were applied to the data.

RESULTS

Maximum number of study subjects (37%) belonged to age group of 25-34 years, followed by age group of 35-44 years (28.5%).

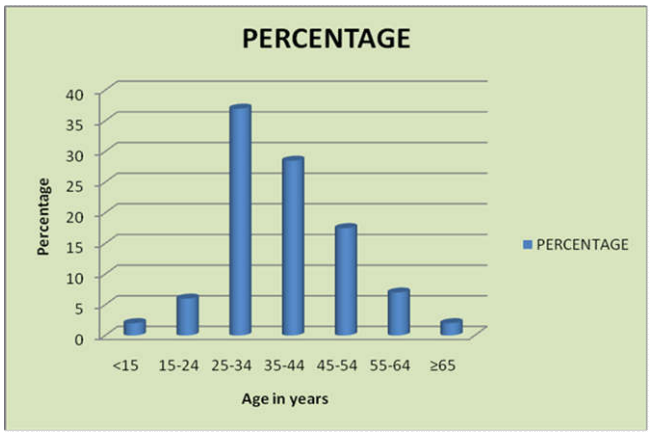

Figure 1. Age wise distribution of study subjects

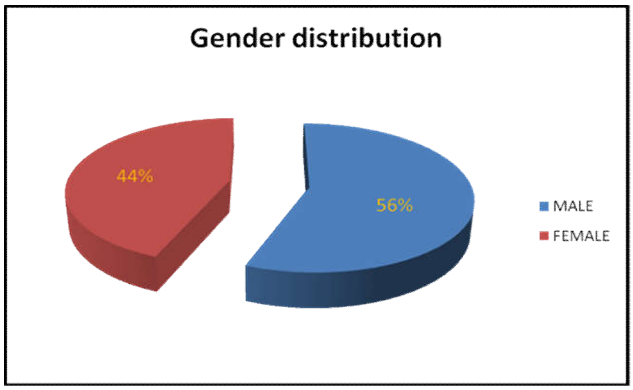

Figure 2. Gender distribution of study subjects

Majority of study population was male (56%)

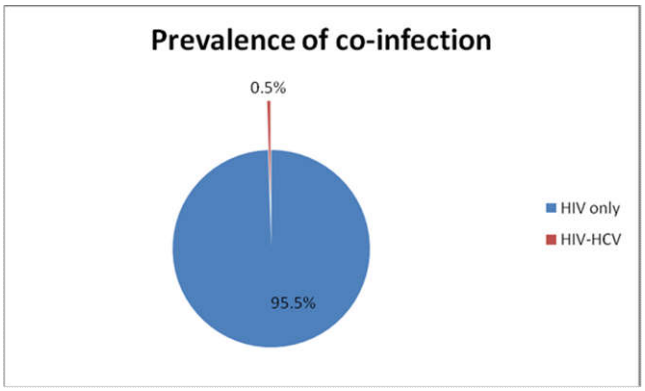

Figure 3. Prevalence of HIV-HCV co-infections in study subjects (n=200)

Table 1. Details of HIV-HCV co-infected case

n = 1	Details
Age	44 years
Sex	Male
CD4 T-cell count	226 cells/µL
WHO stage	II
LFT	Values
Total bilirubin	0.7 mg/dl
ALT	48 IU/L
AST	32 IU/L
ALP	48 IU/L

- CD4 T-cell count was towards lower range. Patient presented with
- WHO clinical stage-II
- The cases had deranged ALT level.

DISCUSSION

Co-infection with viral hepatitis among HIV positive patients is very common and is one of the major causes of raised morbidity and mortality in HIV positive individuals worldwide (Thio *et al*., 2002; Sheng *et al*., 2004). Co-infection of HIV and HCV is known to bring about higher viral load of hepatitis virus and greater liver damage. Also, these patients tend to have a faster progression of hepatic fibrosis. The treatment of co-infection is often challenging because HAART (Highly active antiretroviral therapy) is frequently hepato-toxic, especially in the presence of co-infections (Tankhiwale *et al*., 2003; Mukherjee *et al*., 2013). The impact of HCV is not just limited in causing liver hepato-toxicity but also results in failure in immunological recovery in HIV positive patients, therefore the management of HIV- HCV co-infected patients is complicated. Hence assessment of HIV-HCV co-infection is very important in order to make therapeutic decisions (Wondimeneh *et al*., 2013; Olawumi *et al*., 2014). The present study was aimed to know the prevalence of HCV co-infections in HIV positive patients before initiating ART, who attended an ICTC of a tertiary care hospital. Maximum (37%) of the HIV positive subjects in our study belonged to age group of 25-34 years with male preponderance HIV positive patients which showed presence of anti-HCV by ELISA were considered as HIV-HCV co-infected. As hepatic system is a crucial target of these viruses, we assessed the participants for derangement of liver functions. As this Co-infection often complicate the immunological responses of host, CD4 T cell count of all co-infected cases was assessed as well. An attempt

was made to find out relation between clinical stages of HIV with presence of HIV-HCV co-infection and also we looked for relation of this co-infection with levels of Liver Function Tests. In present study, HIV-HCV co-infection was found in 1 out of 200 (0.5%) of the patients. Various other workers have carried out the studies to know the sero-prevalence of HIV-HCV co-infection.

Sr. No.	Authors	Year and Place	Prevalence of HIV-HCV co-infection
1	Treitinger *et al*. (2000)	2000, Brazil	54.7%
2	Denis *et al*. (1997)	1997, France	31.4%
3	Greub *et al*. (2000)	2000, Switzerland	37.2%
4	Bhattacharya *et al*. (2003)	2003, Pondicherry	21.4%
5	Mendes-Corrêa *et al*. (2000)	2000, Brazil	17.7%
6	Chandra *et al*. (2013)	2013, Hyderabad	8.3%
7	Sungkanuparph *et al*. (2004)	2004, Thailand	7.8%
8	Tankhiwale *et al*. (2003)	2003, Nagpur	7.27%
9	Jain *et al*. (2009)	2009, New Delhi	6.3%
10	Saravanan *et al*. (2007)	2007, Chennai	2.2%
11	Hooja *et al*. (2012)	2012, Jaipur	2%
12	Adesina *et al*. (2010)	2010, Nigeria	1.9%
13	Ahuja *et al*. (2013)	2013, New Delhi	1.7%
14	Tripathi *et al*. (2007)	2007,Lucknow	1.6%
15	.Lodenyo *et al*. (2000)	2000, S. Africa	1%
16	The present study	2016, Maharashtra	0.5%
17	Bhaumik P *et al*. (2015)	2015, Tripura	0.44%

The seroprevalence of HIV-HCV co-infection of the present study is comparable with the seroprevalence of studies done by Saravanan *et al*. (2007), Hooja *et al*. (2012), Adesina O *et al*. (2010), Ahuja *et al*. (2013), Tripathi *et al*., (2007) Lodenyo H *et al*. (2000) and Bhaumik *et al*. (2015) which ranged from 0.44-2.2%. The seroprevalence of HIV-HCV co-infection is lower in present study as compared to the studies done by Bhattacharya *et al*. (2003), Chandra *et al*. (2013), Tankhiwale *et al*. (2003), Jain *et al*. (2009) (6.3-21.4%) from India. This suggests that within India also there is a geographical variation in sero-prevalence of HIV-HCV co-infection. The patient was 44 year old male with a CD4 T-cell count of 226 cells/µL. Tripathi *et al*. (2007) in their study of HCV co-infection in HIV positive patients observed that mean CD4 T-cell count in HIV-HCV co-infected patients was 288.6/mm3. In present study, the HIV-HCV co-infected patient has a CD4 T-cell count of 226 cells/µL, which was lower than the mean CD4 T-cell count (529±273.1 cells/µL) of HIV mono-infected cases. Wondimeneh Y *et al*(6) in their study of similar performed in HIV positive patients found 274±138 /mm^3 as a mean CD4 T-cell count in HIV-HCV co-infected patients while the mean count in HIV mono-infected patients was 288±190 /mm^3 which was comparatively higher than HIV-HCV co-infected patients. The results of present study are in line with the results of these studies. The reason for lower CD4 T-cell count in HIV-HCV co-infected case could be due to increased HIV and HCV replication due to co-infection (Saha *et al*., 2011).

This reflects the immunosuppressed state of HIV-HCV co-infected case. Hence, CD4 T-cell count should be frequently monitored in HIV-HCV co-infected cases to know the immune status of the patients which is likely to suppress faster than HIV mono-infected patients. In present study, liver function tests showed raised ALT whereas, total bilirubin, serum AST and ALP were within normal range. Tripathi AK *et al*(26) in their study observed significantly raised ALT in 2 out of 10 patients of HIV-HCV co-infection. The observation was comparable to the present study. With successful treatment of HIV, it is becoming clear that HCV may lead to early onset of advanced liver disease. Studies have shown that, HCV clearance is associated with the development and persistence of strong virus specific response by CTL and Th. Due to loss of these cells in HIV-HCV co-infection, there is re-emergence of HCV viremia (Tankhiwale *et al*., 2003) This could be the reason for raised ALT in HIV-HCV co-infected case.Hence from present study, we suggest that liver enzymes especially ALT should be looked for to assess liver status in HIV-HCV co-infected cases. The limitation of study was small sample size. Larger multicentric studies need to be done to get an appropriate estimate of the burden of HIV-HCV co-infection in the community. It implies for increasing the awareness among patients as well as health-care providers about this co-infections. Availability of screening for Anti-HCV at ICTCs might aid in identifying undiagnosed HIV-HCV co-infection in individuals infected with HIV. HIV-HCV co-infection increase the risk of hepatic morbidities and mortalities in comparison to when a person is infected with only HIV. This co-infection can modify the overall response to anti-retroviral therapy. Therefore, diagnosis of HCV in HIV positive patients is very important for appropriate management of these co-infected patients. It is also crucial for providing resources in health tactics so that all HIV positive patients have to be tested for HCV and managed promptly.

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