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ORIGINAL ARTICLE

STUDY OF SEROPOSITIVITY OF HBSAG AND ANTIHCV ANTIBODY IN HIV POSITIVE PATIENTS

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ABSTRACT: BACKGROUND: Human immunodeficiency virus (HIV) and Hepatitis Band C viruses (HBV and HCV) are the three most common chronic viral infections documented world-wide.[1,2] These viruses have similar routes of transmission, namely through blood and blood products, sharing of needles to inject drugs and sexual activity, enabling co-infection with these viruses a common event.[3-5] HBV and HCV co-infections in HIV positive individuals is of utmost importance due to the underlying consequences such as the hepatological problems associated with these viruses, which have been shown to decrease the life expectancy in the HIV-infected patients.[5] **OBJECTIVES OF THE STUDY:** To know the sero-positivity of Anti HCV and Hbs Ag in HIV positive patients. To compare it with the prevalence of Anti HCV and Hbs Ag positivity in normal persons. **MATERIALS AND METHODS:** This study was conducted on patients who were admitted to BTGH GULBARGA, meeting inclusion and exclusion criteria between 1-12-2012 to 31-5-2014, 110 patients infected with HIV were taken into the study. The patients belonged to both sexes and age range from 12 to 49 years. Detailed patient data including age, occupation, relevant history, examination finding were noted using prepared proforma and investigations like cbc, HIV, HbsAg, Anti HCV, LFT, were done and reports analyzed. 100 HIV negative persons with age and sex matched were taken as controls **OBSERVATION:** Out of 110 HIV positive patients 73 [66.35%] were males and 38 [34.54%] were males. In both sexes maximum number of cases was present in 40- 49 years age group. Males 23.63% and females 11.81%. Out of 110 HIV positive patients 14(12.72%) were positive to HbsAg and 5(4.54%) were positive for Anti HCV. None of them were positive to both HbsAg and Anti HCV Among the HIV positive patients HbsAg was seen more in age group 30-39yr(6) followed by 40-49yr (4) years of age, showing co-infection is more common in sexually active age group. Males were more positive to HbsAg than females.57.14% for males and 42.85.% for females. Maximum number of cases of HbsAg positive were in age group 20-29 in males (21.4%) and 40 49yr age group for females (2.8%]. Maximum number of Anti HCV antibody positive patients were in age group 30 -39 (3) followed by 40-49 (1) age group. This study shows the prevalence of HbsAg in HIV negative healthy individuals is 5% compared to 12 % for those in HIV positive patients. Anti HCV antibody was nil in controls compare to 4.54% in study group. This shows that HbsAg and Anti HCV antibodies are more common in patients having HIV infection.

KEYWORDS: HIV, AIDS, HBSAg, HCV, Hepatitis.

INTRODUCTION: With the advent of HAART survival among HIV positive patients is increasing and death due to HIV infection is decreasing, whereas death due.to liver diseases are increasing in HIV positive patients. Co-infection with HIV/HBV and HIV/HCV is common because of common modes of transmission and risk groups.

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Human immunodeficiency infection appears to influence the natural history of infection with certain hepatitis viruses. Interaction between the HIV and concurrent infection with hepatitis viruses may alter the natural history and treatment response of both diseases.[1] There is high degree of epidemiological similarity between the Hepatitis B virus and HIV infection as regards to high risk groups, route of transmission and the presence of virus in body fluids.[2]

Recently infection with Hepatitis C virus is being recognized as an important problem. Blood transfusion is well-documented route of transmission of HCV. A large number of HCV infections have been associated with intravenous drug abuse or administration of blood products.[3] The importance of sexual transmission of HCV is debated.

Co-infection of HIV with HBV and/or HCV is known to result in higher viral load of Hepatitis viruses and greater liver damage.[1]The studies of association of HBV and HCV in HIV infection are rare in India. Therefore the present study was undertaken to look at the co-positivity of HCV and HBV in HIV infected patients.

INFLUENCE OF HIV ON TRANSMISSION OF HCV: Though the connection between sexual activity and HCV transmission is debatable there is some evidence that co-infection with HIV may increase the likelihood of HCV transmission by acting as co-factor.[6,7,8] A co-relation between HIV seropositivity and HCV transmission has been reported, where by there was a significantly greater likelihood of HCV seropositivity in MSM who were HIV positive, compare to men who were HIV negative.[9] Increased HIV RNA levels have also been linked in the presence of HCV RNA.

In fact for each unit increased in log HIV RNA level the chances having a positive HIV RNA test increased by 86%. Some speculate that change in the immune system rather than sexual transmission route is responsible this association sometimes detected between HIV and HCV transmission.[11,12.] The other hypothesis is that immune suppression caused by HIV aids transmission of HCV. Subjects who were at high risk of transmission of HCV positive it was found that 100% of them were positive for HCV in which CD4 count was less than 100/cu mm and66.6% in whom CD4 count was greater than 100/cu mm.

Higher HCV viral loads definitely will have a negative impact on therapeutic response among HIV/HCV patients to anti-HCV therapy. Co-infected patients are less likely to clear HCV virus spontaneously.[13] HIV/HCV co-infection is associated with a more rapid progression of liver disease to cirrhosis, liver failure and hepatocelluar carcinoma.[4] In co-infected patients a study indicated that effective suppression of HIV viral levels was associated with a decrease in liver associated mortality.

It is conceivable that as survival of HIV infected individuals increases with potent viral suppression therapies and appropriate prophylaxis of opportunistic pathogens, HCV related morbidity and mortality will be more prevelant[16] In many developed countries HCV related liver disease is already among the predominant cause for death among HIV infected individuals.[17] Influence of HCV on HIV patients with progressive liver disease, portal hypertension and spleenomegaly, the peripheral CD4 count may be lower, giving the clinical picture of a more severe immunodeficiency state than is actually present.[18]

Large cohorts have provided conflicting results regarding risk of progression of HIV infected individuals to AIDS in the presence or absence co-infection. In Swiss cohort study, patients who were co-infected both HIV and HCV had a more rapid progression to AIDS, than those who did not have HCV co-infection.[19]

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This study also found that CD4 T cells count increased less in patients with HCV than those without HCV after effective ART was instituted, suggesting that HCV infection may blunt immune recovery of HIV infected individuals on ART.[19]

INFLUENCE OF HCV ON ART: ART has been associated with hepatotoxicity leading to multiple interruptions causing significant morbidity and mortality. Several studies have demonstrated that hepatotoxicity associated with ART are more common in people co-infected with HCV and HIV, particularly those taking protease inhibitors. Several cohort studies have demonstrated a higher proportion of elevated transaminase levels among those with HCV infection.[20]

INFLUENCE OF ART ON HCV INFECTION: Several studies have suggested that initiation of ART leads to an increase in HCV viral levels. This increase is transient and the viral loads return to baseline levels within Six month of initiation of ART. Serum HCV RNA level increases are associated with increase in ALT and AST levels. The mechanism of HCV RNA levels increase in association with ART associated immune reconstitution is not clearly established.

This may be true in case of HBV co-infection, where the increase in ALT coincides with a decrease in HBV DNA levels, suggesting an immune-mediated viral clearance as a mechanism for this phenomenon. However, the paradoxical increase in HCV RNA levels seen with HCV co-infection may reflect increased replication in some extra hepatic reservoirs or an altered Immune mediated HCV clearance in these patients.

INFLUENCE OF HBV ON COURSE OF HIV DISEASE: There are conflicting data with respect to the impact of HBV on the course of HIV infection. While some studies have shown an increased rate of HIV progression to AIDS among individuals with markers of exposure to HBV others have not shown any change in the progression of HIV disease or survival.

INFLUENCE OF HIV ON COURSE OF HBV DISEASE: The course of acute HBV may be modified in the presence of HIV with lower incidence of icteric illness and a higher HBV carriage rate of about 25% compared with about 5% in those uninfected with HIV. In chronic infection, markers of HBV replication appear to be influenced by HIV infection, there is a trend towards lower rate of clearance of the Hepatitis e antigen and HBV DNA as well as a significant increase in the HBV DNA viral load HIV induced immunosuppression may result in lower serum transaminases, possibly due to a reduction in the severity of liver disease.

However immunosuppression may also be associated with reactivation of HBV infection in persons who have lost detectable HbsAg or HbeAg. Although symptomatic reactivation and loss of Anti HBs is uncommon in HIV infected individuals. Asymptomatic reactivation or reinfection occurs frequently in patients who develop AIDS leading to a significantly higher prevalence of HbsAg. HIV seropositivity is been associated with significantly lower ALT levels, higher serum HBV DNA levels, lower rate of HbeAg and serum DNA clearance, decreased liver injury and an increased loss of anti-HBs.

There is increased evidence of cirrhosis in patients co-infected with HIV and HBV. HAART may have an effect on the HBV infection. With all anti-retroviral agents may be directly hepatotoxic

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and causes elevation in transaminase levels in patients with chronic hepatitis, HAART induced immune reconstitution can also cause an initial flare up of the transaminase levels.

OBJECTIVES OF THE STUDY:

1. To know the sero-positivity of Anti HCV and HbsAg in HIV positive patients.
2. To compare it with the prevalence of Anti HCV and HbsAg positivity in normal persons.

MATERIALS AND METHODS: This study was conducted on patients who were admitted to BTGH GULBARGA, meeting inclusion and exclusion criteria between 1-12-2012 to 31-5-2014,.110 patients infected with HIV were taken into the study. The patients belonged to both sexes and age range from 12 to 49 years. Detailed patient data including age, occupation, relevant history, examination finding were noted using prepared proforma and investigations like cbc, HIV, HbsAg, Anti HCV,LFT, were done and reports analyzed.100 HIV negative persons with age and sex matched were taken as controls.

METHOD OF COLLECTION OF DATA:

INCLUSION CRITERIA: Patients who tested positive for HIV as per NACO guidelines were taken into the study.

EXCLUSION CRITERIA:

1 Patients less than 12 years of age.
2 Patients who were part of other study groups.

Blood samples were tested for HIV antibodies by using 3 ERS (Elisa, rapid, and simple) format. HIV infected patients were classified into various stages of HIV infection on clinical basis according to the CDC classification system. Sera of HIV positive patients were subjected to HbsAg and anti HCV antibodies testing. A total of 100 healthy HIV negative persons were taken as controls and there sera also subjected to HbsAg and Anti HCV antibody testing. Anti HCV antibody was tested by using third generation ELISA kit (ERBA Biochem Japan) HbsAg was tested by third generation ELISA kit (general biological corporation Taiwan.

RESULTS: After detailed history, clinical examination, HIV, HbsAg, Anti HCV antibody testing, the results were obtained and tabulated in following table.

Serial no.	Age group in years	No. of cases	Percentage
1	12-19	5	4.54%
2	20-29	17	15.45%
3	30-39	28	25.45%
4	40-49	39	35.45%
5	50-59	21	19.09%

Table 1: Age distribution of HIV patients: Age distribution of HIV patients

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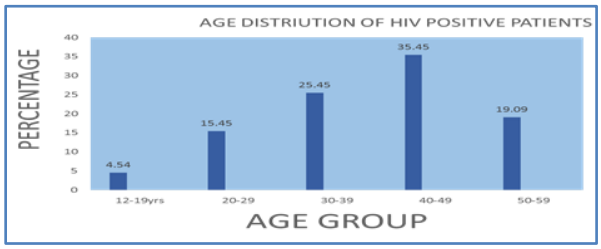
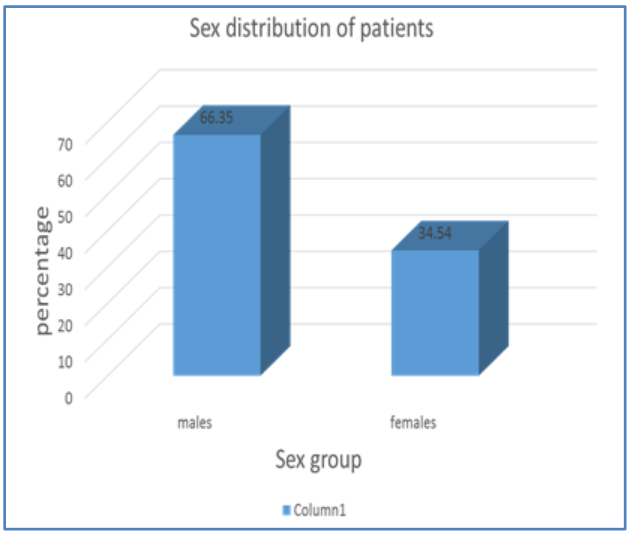


GRAPH–1

Graph 1 of the total 110 cases maximum number of cases were in the age group 0-49 yrs of age i.e. 67 (49.96%) and among them 28 (25.45%) were in there third decade and 39 (35.45%) were in there fourth decade.

Total no. cases	Males		Females	
110	Number	Percentage	Number	Percentage
	73	66.35%	38	34.54%

Table 2: sex distribution of patients



GRAPH–2

Out of 110 HIV positive patients 73[66.35%] were males and 38[34.54%] were males.

Sl. No.	Age group in years	No. of cases		Percentage	
		Males	Females	Males	Females
1	12-19	2	3	1.99%	2.72%
2	20-29	12	5	10.99%	4.54%
3	30-39	19	9	17.36%	8.19%

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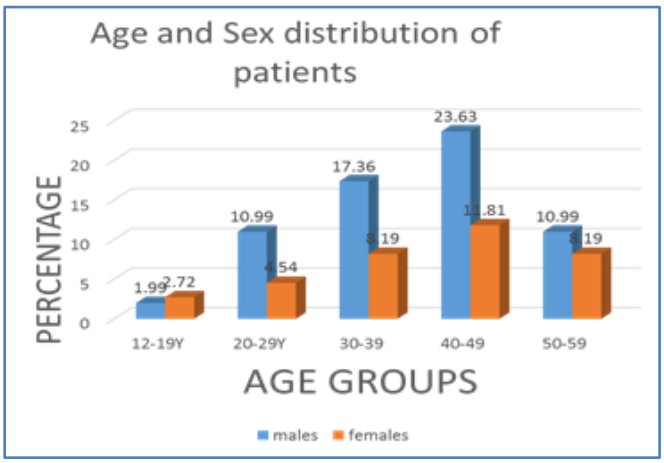
84	40-49	26	13	23.63%	11.81%
5	50-59	12	9	10.99%	8.18%
Total		**73**	**39**	**66.35%**	**35.45%**

Table 3: Age and sex distribution of patients

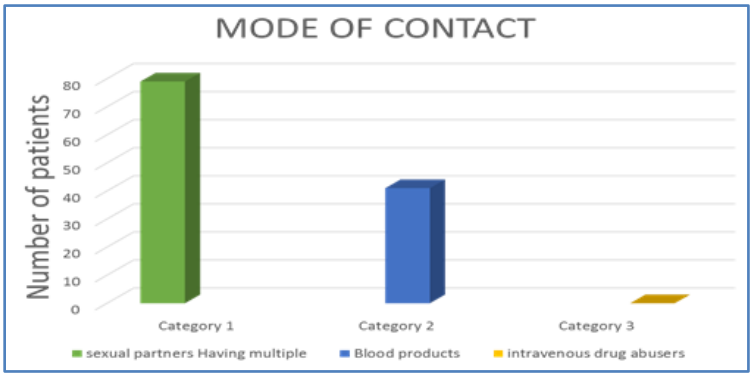


GRAPH–3

In both sexes maximum number of cases was present in 40- 49 years age group. Males 23.63% and females 11.81%

No of patients	sexual partners Having multiple	Blood or blood product transfusion	Intravenous drug abusers
110	79	41	0

Table 4: Percentage of people with different risk behaviour



GRAPH–4

Maximum number of patients in this study were having multiple sexual partners and unprotected sex as major risk behaviour,79 out of 110 had this risk were as 41 had possible transfusion related risk factor. None of them were intravenous drug users.

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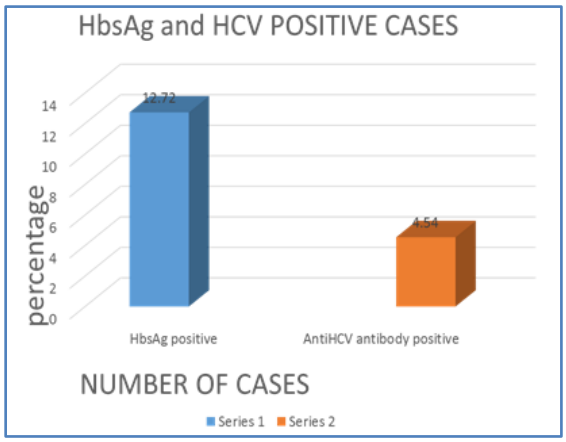
No. of cases	Hbs Ag positive		Anti HCV antibody positive	
	Number	Percentage	Number	percentage
110	14	12.72	5	4.54%

Table 5: Percentage of HbsAg positive and anti HCV antibody positive patients.

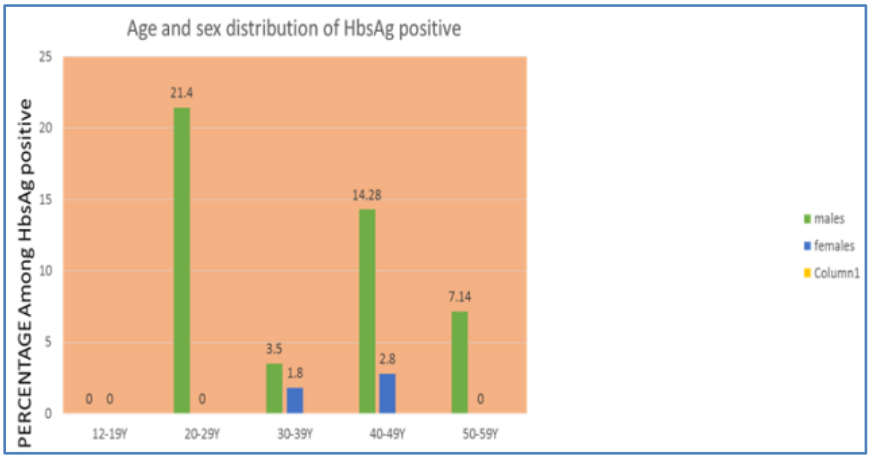


GRAPH–5

Out of 110 HIV positive patients 14(12.72%) were positive to HbsAg and 5(4.54%) were positive for Anti HCV. None of them were positive to both HbsAg and Anti HCV.

Age group	Males	Percentage	Females	Percentage
12-19	1	12.5%	0	0
20-29	4	50%	1	33.3%
30-39	3	37.5%	2	66.4%
40-49	0	0	0	0
50-59	0	0	0	0

Table 6: Age and sex distribution of HbsAg positive cases.



GRAPH–6

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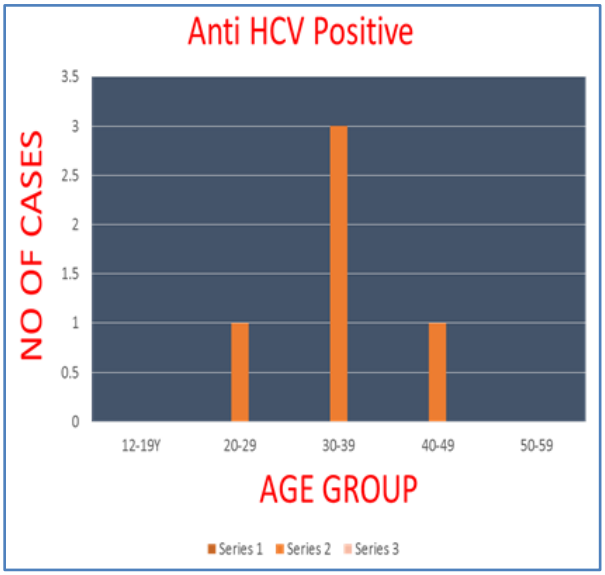
Maximum number of cases of HbsAg positive were in age group 20-29 in males (21.4%) and 40 49yr age group for females (2.8%).

Age group	12-19	20-29	30-39	40-49	50-59
No. of positive pts	0	1	3	1	0

Table 7: Age distribution of Anti HCV antibodies positive patients.



GRAPH–7

Maximum number of Anti HCV antibody positive patients were in age group30 -39 (3) followed by 40-49 (1) age group 40 percent were males. And 60 percent were females.

Stage	No. of HIV positive pts	No. of HbsAg positive patients	No. of Anti HCV positive pts
Category A: Asymptomatic infection	21	1	0
Category B Persistent generalized lymphadenopathy	43	4	1
Category C Symptomatic HIV disease	46	9	4
Total	**110**	**14**	**5**

Table 8: presence of HbsAg and Anti HCV antibody in different stage of HIV infection.

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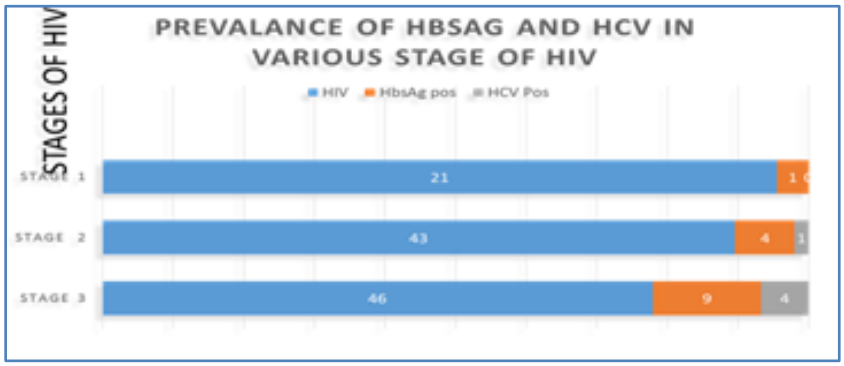
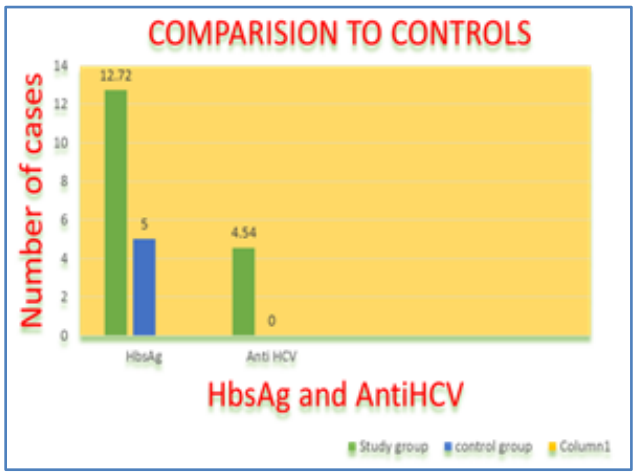


GRAPH–8

Maximum number of co-infected cases was seen in category c stage of the disease. HbsAg it was 9 cases and Anti HCV 4 the cases were in that stage 3 of disease.

Group	HbsAg	Anti HCV
Study group	10%	2.7%
Control group	3%	0%

Table 9: Percent sero positivity in controls and study group



GRAPH–9

This study shows the prevalence of HbsAg in HIV negative healthy individuals is 5% compared to 12 % for those in HIV positive patients. Anti HCV antibody was nil in controls compare to 4.54% in study group. This shows that HbsAg and Anti HCV antibodies are more common in patients having HIV infection

DISCUSSION: The survival among HIV infected individuals increasing and they are surviving up to a longer age, due the advent of HAART, but they are suffering more due to liver diseases caused by hepatitis B and Hepatitis C virus.

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Co-infection is common because of common mode of transmission and similar risk behavior. Many studies have been done in the western countries regarding the co-positivity of HIV with HbsAg-ant HCV but there are very few studies done in India. Considering the above this study was done at BTGH GULBARGA. This study comprises, confirmed HIV positive individuals who were subjected to HbsAg and Anti HCV antibody testing using commercially available ELISA kits. Various studies denote the HbsAg and anti HCV antibody co-positivity from 8-30 % for HbsAg and 3-20% for Anti HCV.

INDIAN STUDIES:

Author	Sample size	HbsAg	Anti HCV
Thankiwale s s et.al	110	30.9%	7.27%
Dhanvijay et.al	175	28.0%	-
K.Agarval et.al	100	13%	-
Ramanamma et.al	140	14.3%	3%
Sud A et.al	57		5.3%
Shazia m ehsaan et.al	200	3.5%	8%
Our study	110	10%	2.7%

Table 10: Comparision between other studies and our study

FOREIGN STUDIES:

Author	Sample size	HbsAg	Anti HCV
Agbaji o et.al	1044	14.8%	7.6%
Saillor f et.al	1935	6.9%	42.5%
K seme et al	136	-	16.9%
Orkanga et.al	232	9%	23%
S.K Mustapha et al	200	26.5%	-
Dimitrakopoulas et.al	181	67.5%	13.8%
Our study	110	10%	2.7%

Table 10: Comparision between other studies and our study

It is evident from various Indian studies that co-positivity of HbsAg and Anti HCV in HIV positive individuals is low if compared to foreign studies but still it is significantly higher. It is evident from literature and which is also present in our study the maximum number of co-positive patients are in 20-40 age group. K agarval, S K Sarin of Moulana Medicle College found maximum number of cases to be in 20-40 years age group.

In comparison to western studies co-positivity is lower in India. In HIV Atlanta cohort study it was found that Anti HCV was prevalent at rate of 32% among HIV positive individuals. In western countries among co-infected individuals, the risk behaviour was different from the Indian population, there HIV spread is more common with Intra venous drug abuse, this mode of transmission is negligible in India except in metro cities and north eastern states which shows higher Anti HCV prevalence than our studies.

Since there is a changing trend of HIV transmission with increase in intravenous drug abuse the co-infection with Hepatitis B and Hepatitis C may increase. As literature shows that co-infectivity with Hepatitis B and Hepatitis C virus with HIV causes increased damage to Liver resulting in increased mortality and morbidity, it is advisable to test every HIV positive individual with HbsAg and Anti HCV, and if not exposed to infection vaccination should be given to such individual

CONCLUSION: The present study concluded that

1 Co-positivity with HbsAg in HIV positive patients was found to be 12.72%.
2 Co-positivity with Anti HCV antibody was found to be 4.54%.
3 Age group 40-49 years showed highest co-positivity for HbsAg.
4 Age group 40-50 years showed highest co-positivity for Anti HCV antibodies.
5 Study showed Male pre-ponderance.

Study also shows that highest co-positivity is seen in advanced stage of HIV disease.

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