

# FREQUENCY OF NEWLY DIAGNOSED HEPATITIS B AND C VIRUSES IN PATIENTS WITH HUMAN IMMUNODEFICIENCY VIRUS AND THEIR COMMON LEADING FACTORS

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## ABSTRACT

**Objective:** To determine the frequency of Hepatitis B and C viruses in patients with Human immunodeficiency virus (HIV) and their common leading factors in Khyber Pakhtun Khwa (KPK).

**Methodology:** This descriptive study was performed at Anti Retroviral Therapy (ART) center, Peshawar from 5 years from January 2006 to June 2011. Total of 710 patients were registered/diagnosed with HIV during this period; All patients were analyzed for the presence of Hepatitis B virus (HBV) and Hepatitis C virus (HCV) on the basis of the presence of HBs Ag and anti-HCV markers.

**Results:** In patients infected with HIV, the frequency of co-infection with HBV was 9.57% (68/710), with HCV was 6.76% (48/710) and with both HBV and HCV was 2.39% (17/710). Commonest leading factor was intravenous drug use (IVU) 53%, 66%, and 53% for HIV and HBV, HIV and HCV, HIV HBV and HCV co-infections respectively followed by blood transfusion, heterosexual transmission, male having sex with male (MSM), vertical transmission respectively.

**Conclusion:** The frequency of HBV and HCV co infections is increasing in patients infected with HIV and they share common leading factors so its essential that all the patients infected with HIV be screened for HBV and HCV co-infection as early treatment of hepatitis can significantly decreases the morbidity and mortality.

**Keywords:** HIV, HBV, HCV, frequency, co-infection, IDU, blood transfusion, heterosexual transmission, MSM, vertical transmission.

## INTRODUCTION

Globally HIV is a major public health problem. Currently, more than forty million people worldwide are infected with HIV/AIDS and more than 3.1 million AIDS related deaths occur worldwide each year<sup>1</sup>. In Pakistan HIV epidemic is increasing due to lack of knowledge on HIV and its routes of transmission<sup>2</sup>. People with HIV infection are often affected by viral hepatitis, which can cause long-term illness and death. Among the individuals infected with HIV, it is estimated that 2-4 million people have chronic HBV co-infection, while 4-5 million are co-infected with HCV globally. However prevalence of co infection varies geographically depending on the different risk factors in different populations like in people with HIV in the Western Europe and United States, about 25 to 30% are co-infected with HCV, and about 6 to 14% are co-infected with HBV<sup>3</sup>. In a study from India the prevalence of co-infection of HBV with HIV was 9% and of HCV with HIV was 6.3% and with both HBV and HCV was 1%<sup>4</sup>. The geographical variance of co-infec-

tion rates of HBV and HCV may be due to different risk factors and type of exposure. In US About 80% of people with HIV who inject drugs also have HCV<sup>5</sup>. In a study from china in HIV-positive patients 85% were HCV positive and 2.5% were HBV positive, with commercial blood donation was the most common risk factor<sup>6</sup>.

Viral hepatitis progresses faster and causes more liver-related health problems among people with HIV than among those who do not have HIV. Although drug therapy has extended the life expectancy of people with HIV, liver disease much of which is related to HCV and HBV has become the leading cause of non-AIDS-related deaths in this population<sup>5,7</sup>. In a multi-center AIDS cohort study, it was observed that liver-related mortality rates per 1000 persons were 1.7% in HIV-seropositive patients, 0.8% in HBsAg positive patients and 14.25% in the co-infected patients (significantly higher as compared with mono-infected patients)<sup>8</sup>. The progression of chronic HBV to cirrhosis, end-stage liver disease, and/or hepatocellular carcinoma is more rapid in HIV-infected persons than in persons with chronic HBV alone<sup>9</sup>. Long-term studies of patients with chronic hepatitis C virus (HCV) infection show that approximately 33% of the patients progress to cirrhosis at a median time of less than 20 years. This rate of progression increases with older age, alcoholism, male sex, and HIV infection<sup>10,13</sup>. A meta-analysis demonstrated that the rate of progression to cirrhosis for persons co infected with HCV/HIV was about three times higher than the rate for HCV mono-infected patients<sup>14</sup>. This accelerated rate

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is magnified in patients with low CD4 counts. Chronic HCV infection also complicates HIV treatment due to the increased frequency of highly active antiretroviral (HAART) associated hepatotoxicity<sup>15,16</sup>.

People with HIV who are co infected with either HBV or HCV are at increased risk for serious, life-threatening complications. Routes of transmission for HIV, HBV, and HCV are common<sup>4</sup>. Intra venous drug users (IDU), Blood transfusion, heterosexual transmission, male having sex with male (MSM) and vertical transmission are the likely leading factors. As a result, anyone living with HIV should be tested for HBV and HCV and HBV vaccination should be given to high-risk patients. Expert guidelines developed in the United States and Europe recommend screening of all individuals infected with HIV for infection with HCV and HBV to help in appropriate management of such patients. In developing countries like Pakistan no such uniform guidelines are available due to limited efficient data from all regions. This study is planned to evaluate the frequency of HIV co-infection with Hepatitis B and C viruses in patients of KPK and their common leading factors.

## MATERIALS AND METHODS

The present study was conducted in ART center hayatabad medical complex Peshawar and PGMI Lady Reading hospital Peshawar from June 2006 to June 2011. This is the only center that provides HAART therapy to the patients of HIV after assessing and registering them. It is descriptive cross sectional study and sampling technique is probability sampling with simple random collection. 710 HIV/AIDS patients during this period were screened for hepatitis B and C. Those patients who were tested positive on ICT method was further confirmed by Elisa. For HBV the screening marker used is HBV surface antigen (HBsAg). The test is performed using commercially available enzyme linked immunosorbent assay. Anti-HCV is done using 3<sup>rd</sup> /4<sup>th</sup> generation ELISA. The test is performed as per the manufacturer's instructions. The validity of the test

is assessed as per the given criterion and the result is calculated. Serum samples that giving borderline results are retested and those repeatedly giving borderline values are considered negative. Detailed history was taken about the likely leading factor and after their informed consent data was recorded on preformed Performa without showing their names. Percentages were calculated for quantitative data like age, and leading factors like IDU, blood transfusion, heterosexual transmission, MSM, vertical transmission and numerical variable like age was presented as mean  $\pm$  SD. Bias in the study was controlled by following strict inclusion and exclusion criteria, and analysis was done using SPSS version 16. The study was then approved by the ethical committee of the hospital.

## RESULTS

During this 5 years study period 710 HIV/AIDS patients were registered at ART centers. The mean age of the study group was 28.4 years old. The percentage of male patients was 71.54% (508/710) as compared with 24% (171/710) for female patients. Thus, the male: female ratio of the study group was 2.9:1.

The frequency of HBV as assessed on the basis of the presence of HBs Ag in patients infected with HIV was 9.5% (68/710), the prevalence of HCV with HIV was 6.76% (48/710) and the frequency of HIV with both HBV and HCV was 2.39% (17/710). The distribution of HBV and HCV co-infection in patients infected with HIV is as shown in table no.1

Commonest leading factor was IDU as 53% (36/68), 66.6% (32/48), and 53% (9/17) for HIV+HBV, HIV+ HCV, HIV+ HBV+ HCV co-infections respectively followed by blood transfusion which was 30.8% (21/68), 16.6% (8/48), and 23.5% (4/17) for HIV+ HBV, HIV+HCV, and HIV+ HBV+HCV co-infection respectively. Heterosexual transmission was 8.8% (6/68), 8.3% (4/48), 17.6% (3/17), for HIV+HBV, HIV+HCV, and HIV+ HBV+HCV co-infection respectively. MSM was 5.8% (4/68),

**Table No.1: Distribution of HIV+HBV, HCV+HIV and HIV+HBV+HCV co infection by age and Gender in the study group.**

Age in years	Patients with HIV+HBV		Patients with HIV+HCV		Patients with HIV+HBV+HCV	
	Male	Female	Male	Female	Male	Female
<10	00	01	00	00	00	00
10 to 20	02	00	03	00	02	00
21 to 30	12	04	20	02	08	00
31 to 40	16	03	13	01	06	00
41 and above	29	01	08	01	01	00
Total	59	09	44	04	17	00
Grand total	68 (9.5%)		48 (6.76%)		17 (2.39%)	

**Table No.2: Leading factors for HIV+HBV, HIV+HCV, HIV+HBV+HCV co-infection:**

S.No	Leading Factor	Patients with HIV+HBV (n=68)	Patients with HIV+HCV (n=48)	Patients with HIV+HBV+HCV (n=17)
1	IDUs	36 (53%)	32 (66.6%)	9 (53%)
2	Blood transfusion	21 (30.8%)	8 (16.6%)	4 (23.5%)
3	Heterosexual transmission	7 (10.3%)	4 (8.3%)	3 (17.6%)
4	MSM	4 (5.8%)	1 (2.08%)	1 (5.8%)
5	Vertical transmission	0	3 (6.25%)	0

2.08% (1/48), 5.8% (1/17) for HIV+HBV, HIV +HCV, and HIV+HBV+HCV co-infection respectively. Vertical transmission was 1.4 (1/68), 6.25% (1/48) for HIV+HBV, HIV+HCV co-infection. While no case of vertical transmission was found HBV+HCV+HIV co-infection. The distribution of leading factors is shown in table no.2

## DISCUSSION

Worldwide three most common chronic viral infections are HIV, HBV and HCV. These viruses have similar routes of transmission like sharing needles to inject drugs, blood products, sexual activities making co-infection with these viruses a common event. Risk of HAART induced hepatotoxicity and onset of AIDS defining illness is more common in HIV co-infection with HCV than HIV alone. Similarly HBV co-infection in HIV patients makes prognosis worse<sup>17</sup>.

Our observations showed that the mean age of the study group is less as compared with previous studies from India<sup>18-19</sup>. Thus, the younger population in the economically productive age group is being increasingly affected by HIV, leading to a loss to the economy. This could be because of the increased exposure of this population to the risk factors like promiscuity, parenteral drug abuse, etc. The increase in the prevalence of HIV infection in the younger population could also be attributed to a lack of awareness in spite of intensive programs carried out on the national and international levels.

The study group comprised predominantly of a male population (73%), which is significantly higher than the female population (27%;  $P < 0.01$ ). This is in accordance with previous studies showing that male subjects are at a significantly higher risk of acquiring HIV infection<sup>19-20</sup>.

In the present study, the rate of co-infection with HBV and HCV either alone or in combination was ~ 17%, a significantly higher rate than reported in the general population<sup>21-22</sup>. In the present study, both the HIV/HBV and HIV/HCV co-infections were higher in the sexually active age group as compared with another study from India<sup>23</sup>. Where HCV/HIV co-infection was higher in the > 50 years old age group. In India, we could not find a study where co-infection with both HCV and HBV was reported in patients with HIV as seen in the present study, hence, it is likely that the prevalence

rate of HBV and HCV is increasing in patients infected with HIV and both these viruses can be seen in the same patient.

In our study IDU was the most common leading factor for all the three types of co-infection which is similar to studies from Western Europe and USA and China<sup>3,24,25</sup>. Blood donation was the second most common leading factor which can easily be avoided by proper screening but commercial blood donation is a serious issue as was found in a study from china<sup>6</sup>. Sexual transmission was relatively low and MSM did not seem to have an overall increase risk for co-infection similar to study in Spanish prisoners<sup>24</sup>. Vertical transmission was found to be a leading factor only for HIV+HCV co-infection. This transmission is probably associated with increase HCV RNA levels increasing the risk of co-infection in babies<sup>24,26</sup>.

## CONCLUSION

The implication of HBV and/or HCV co-infection in patients with HIV is of serious concern in developing countries like Pakistan. Knowledge about HBV/HCV co-infection in individuals infected with HIV has become important as they share common leading factors. Liver diseases related to HBV and HCV co-infection in these patients is major cause of mortality in HIV patients and treating HIV with HAART is another issue due to HAART associated hepatotoxicity. The present study underlines the necessity of a uniform guideline in which all the patients infected with HIV should be screened for HBV and HCV to help the management of co infection.

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