Original Research Article

Frequency of HCV and HBV Co-infections in HIV positive patient in city of Iran: a cross-sectional study

Abstract:

Aims:

One of the current crises of the society is prevalence rate of viral co-infection of hepatitis B and C among HIV patients.HIV, HBV, and HCV are major public health concerns. Because of shared routes of transmission, HIV-HCV coinfection and HIV-HBV coinfection are common. HIV-positive persons are at risk of being infected with HBV and HCV. Frequency of co-infection with HBV and HCV in HIV-patients is depended on the geographic regions and the type of exposure. The aim ofthisstudy was to determinethe prevalence of HIV, HBV and HCV co-infectioninoneof the medical educational centers of Lorestan province, Iran.

Study design: This Cross-sectional One Shot Case Study Designto determinethe prevalence ofconcurrentviralinfection in the cityof Khorramabad, iran.

Place and Duration of Study: Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran and shohadayeashayer hospital, Khorramabad, iran, in 2013

Methodology:

This cross-sectional studywas designed in 2013in order to study the prevalence of co-infection among 500 outpatients and inpatients referring to ShohadayeAshayer Hospital, Khorramabad, Lorestan province. The existence of specific antigen and antibody against the virus was determined by Enzyme-Linked Immunosorbent Assay. (Demographic information was extracted from the patients' medical files and SPSS software was used to determine frequency. The data were analyzed by t- and Chi-square tests. Significance level of 0.05 % was considered in this study.

Result:

103 out of 500 studied serum samples were infected with HBV, HCV, and HIV viruses. Maximum infection was in the age range of more than 40 years old, which was equal to 23 patients (24.7%). 58 out of 103 samples were inpatients, 18 (9.4%) of whom were co-infected. 3 out of 103 studied samples (5.9%) who were co-infected with HIV/HBV/HCV were male. On the other hand, 4 (3.9%) male patients were infected with HIV/HBV and 4 (7.8%) male patients were co-infected with HBV/HCV. Also, 23 (22.3%) patients were co-infected with HIV/HCV; one (1.9%) was female and 22 (43.1%) were male.

Conclusion:

Patients whohavebothhepatitis B and Cinfections when areassociated withHIVinfectionthediseasebecomesmore severe.Using chi-square test, a statistically significant relationship was detected between hospital care of patients and prevalence of con-infection. Due to frequent injections in the hospital and taking blood and its products, inpatients were more susceptible to infection than outpatients. So, the probability of their infection with viruses was higher than outpatients. This issue is a disturbing factor in medicinal centers which should receive more attention.

Key words:*Co-infection, Hepatitis B, Hepatitis C, ELISA, HIV*

1. INTRODUCTION

HIV, hepatitis C virus (HCV), and hepatitis B virus (HBV) are three important factors of blood-borne diseases (1). Hepatitis B is one of the most prevalent infectious diseases in the world. About 400 million worldwide are carriers of hepatitis B virus. According to the recent report of World Health Organization, after tuberculoses and malaria, hepatitis B is the most prevalent contagious and infectious disease with the annual emergence of 50 million people (2). These patients are also exposed to the risk of liver cirrhosis and hepatocellular carcinoma (HCC). Prevalence of hepatitis B carriers in Iran is 3% of the society or about two million people (3). HCV infection is another blood-borne infection which has infected approximately 170 million people in the world (3). Hepatitis C is among the important factors for chronic liver diseases and, due to its long-term treatment process, can lead to cirrhosis and liver cancers (4). Infection with HCV and HBV are two important factors of mortality and disability, which impose financial expenses to the society and are among the important problems of world health (4). Acquired AIDS is a spectrum of abnormalities caused by disorder in the function of cellular and humoral immunity which is resulted from HIV infection (4). According to the recent statistics, about 33 million HIV-infected patients are currently living in the world and more than 20 million of them have died so far. 5800 people per day are infected with this virus, 90% of whom are in developing countries (4). In addition to blood transfusion, this virus can be transferred via other ways such as injection of intravenous drugs by infected instruments, taking coagulating factors, hemodialysis, homosexual and heterosexual contacts, and from mother-to-child-transmission(MTCT) (5, 6). According to Screening of all donated blood for hepatitis B, which already takes place and increasing use of hepatitis B virus vaccine, fortunately, the prevalence record of this infection has been remarkably decreased. But, due to the lack of a vaccine for preventing the infections caused by hepatitis C and HIV viruses, infection with these diseases has still remained a challenge.Fortunately, in Iran the prevalence of HIV among blood donors is not very high and it shows blood safety(7, 8). Patients hospitalized in different medical centers, especially dialysis, thalassemia, and hemophilia patients, are more liable than outpatients to infection with viral infections and consequently hospital infections, which is due to frequent receiving of blood products and coagulated concentrates (9, 10). AIDS affects all the body systems due to causing extreme immune disorders. These disorders have been comprehensively investigated in the world. Mortality risk of liver diseases has a reverse relationship with the number of CD_4s (11). Increased rate of hepatocellular carcinoma hepatotoxicity due to taking antiretroviral drugs has been also observed among the patients co-infected with HCV, HBV, and/or HIV (11, 12). Considering the accompanying problems of HIV patients, the probability of infection with hepatitis B and C is very high among them (13). Transfer risk of infectious diseases through blood can be measured by analyzing and studying information of blood donors, screening methods, and prevalence rate of serologic markers of infective diseases (13). Obviously, the important point about these infections is determining the prevalence rate of carriers and patients in the region in order to plan and adopt effective strategies in terms of prevention and control by the related organizations and develop an appropriate ground for researchers and thus assist medical and health systems using the statistic data obtained from relative frequency distribution of these infections and their analysis (14). So, the goal of the study was to examine the co-frequency of these transferable infections among inpatients and outpatients referring to ShohadayeAshayer Hospital, Khorramabad,iran, in 2013.

2.METHODOLOGY:

This cross-sectional study was carried out from March to February 2013.500 serum samples of outpatients and inpatients referring to ShohadayeAshayer Hospital, Khorramabad, Lorestan province.Samples were studied to investigate the presence of antigen of HIV, HBV, and HCV viruses using ELISA kit (past kit,Tehran,iran- pishtazteb, Tehran, iran- Aesku/ISA.Diagnostics, Germany) and Biotech kit (Irland) for antibody.Samplingwasbased on therequest ofthe physicianand patient satisfaction.

Studying the files of the participants led to obtaining some information such as age, gender, and inpatient or outpatient conditions. ELISA reader device (Stat Fax, model 2100, USA) was used to read the results of ELISA test. The data were analyzed in SPSS statistic software using descriptive statistics, Chi-square test, and t-test at the significance level of 0.05.

3. RESULT

One hundred and three out of 500 patientswere infected with HCV, HBV, and HIV viruses, 52 were female and 51 were male, respectively. Age range was between 20 and 40 years old. 5% of patients were below 20, among whom only 1 case (1.1%) had HIV-HCV co-infection. Maximum infection was in the age range of more than 40, which was equal to 23 people (24.7%). 58 out of 103 samples were related to inpatients, 18 people (19.4%) of whom had co-infection (Figure 1). 20 out of 103 studied samples were infected with HIV, 10 people (19.2%) of whom were female and 10 (19.6%) were male. Seventeen patients were only infected with HBV, 17 people (23.1%) of whom were female and 5 (9.8%) were male. Thirty-two patients were HCV+, 29 people (55.8%) of whom were female and 3 (5.9%) were male(table 1).

Three (2.9%) out of 103 studied samples had HIV/HBV/HCV co-infection, all of whom were male. On the other hand, 4 (3.9%) male patients were infected with HBV/HIV and 4 (7.8%) male patients had HBV/HCV co-infection. Moreover, 23 (22.3%) patients had HIV/HCV co-infection, among whom 1 (1.9%) was female and 22 (43.1%) were male. According to the results obtained by Chi-square test, there was no significant relationship between age increase and co-infection (p=0.945). According to Chi-square test, the relationship between hospitalization and co-infection prevalence was significant (p=0.021); thus, hospitalization of patients can be a factor for the generation of co-infection, specifically in patients with impaired immune system.

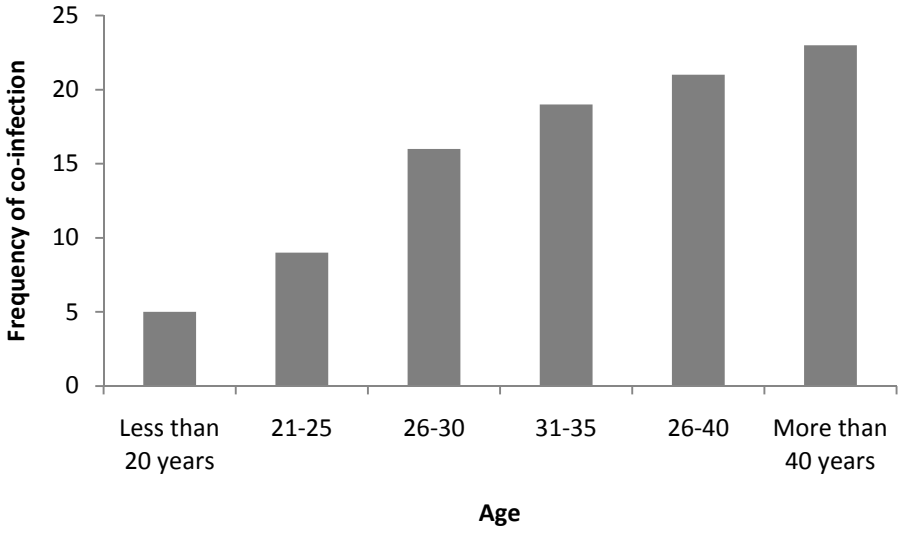

Fig.1. Studying co-infection prevalence in patients with HIV/HBV/HCV co-infection in the age range of less than 20 to more than 40 in ShohadayeAshayer Hospital, Khorramabad, Lorestan province, iran

Table 1. Prevalence of co-infection HIV-HBV-HCV in male and female patients admitted to shohadayeashayerhospital,Khorramabad, Iran, in 2013

Genus	HIV	HCV	HBV	HIV-HCV	HIV-HBV	HCV-HBV	HIV-HBV-HCV	Total
Male	10(19.6%)	3(5.9%)	5(9.8%)	22(43.1%)	4(3.9%)	4(7.8%)	3(5.9%)	51
Famale	10(19.2%)	29(55.8%)	12(23.1%)	1(1.9%)	0	0	0	52
Total	20(19.4%)	32(31.1%)	17(16.5%)	23(22.3%)	4(3.9%)	4(3.9%)	3(2.9%)	103

4. DISCUSSION:

One of the most important and prevalent diseases accompanying HIV infection is hepatitis B and C and different studies have been done in this regard. When the patients with both types of hepatitis B and C are co-infected with HIV, they will suffer from more severe compilations (15). According to the obtained results, men had more HIV/HBV/HCV co-infection than women so that 33 of men were infected, while just 1 female patient had this co-infection (p=0.945). In a study at Imam Khomeini Hospital, Tehran, Iran, in 2005– 2010, 85 (29.2%) out of 291 male patients had HIV/HBV/HCV co-infection and, in comparison with the present study, the prevalence of co-infection among the studied male patients was higher during a year (11). In a research in the west of Iran, maximum rate of infection was in the average age range of 31-50 years old, which was in accordant with the current study, and can be due to the point that hepatitis vaccination of children which was started from 1993 in Iran somehow decreased such infection among the youth in the west of Iran (12). In a study in 2011, maximum rate of co-infection with these three types of viruses was reported in the age range of less than 40 at Tehran AIDS Research Center and between 21-46 years old at Imam Khomeini Hospital, which was somehow contrary to the co-infection prevalence in the present investigation (11, 13). Also, in a study in Tehran by Rahimi A and *et al*(2009), maximum co-infection was in the age range of less than 20 years old (14). A study in Brazil showed that maximum viral co-infection (HIV/HCV) was among young men (71%) (15). Since Iran is an Islamic country and people follow Islamic religious principles, less prevalence of viral infections among the youth has been reported in this country. In western societies, a higher degree of infection has been reported due to free homosexual and heterosexual contacts (15). Among the inpatients of this study, about 19.4% were co-infected with HIV/HBC/HCV, which may indicate that while patients are hospitalized due to infection with one of these viruses, they simultaneously suffer from other underlying viral diseases. Moreover, due to frequent injections and intake of blood and its products, inpatients are more exposed to infections than outpatients; therefore, they are in a worst condition and have higher risk of infection with other viral diseases compared with outpatients (16, 17). Alsoin this studyall tests wererepeatedtwice to ensureaccuracy. The molecular tests such as PCR is not performed in the hospital, after positive tests, PCR to patients in othercenterssuch as

bloodtransferisrecommended. Considering the above-mentioned points and comparison of the frequency of co-infection in this study with other investigations, and the number of patients and study period, it was found that the prevalence of these infections was considerable in Lorestan province. This issue can be due to different reasons such as high degree of unemployment which was about 12.2% in this province (18). Unemployment can cause several problems such as sociological problems, increased psychological abnormalities, and addiction which may result in increased infections. Psychological abnormalities, addiction, and lack of knowledge about infection manner and other cases are among the factors that highly influence increased prevalence of these viral diseases (18, 19). Finally, it is recommended to take some measures for freely and confidentially testing the patients with high risk. This issue can be influential in the decrease of viral infections, especially co-infection, and improvement of the society's health (20).This study aimed to examine HBV and HCV coinfection serologically and determine the shared and significant factors in the coinfection of HIV-positive patients was conducted.Provide different information from different geographic locations can make decisions in the field of infection control and effective global public health.

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Competing interests:

The authors declare that they have no competing interests.

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