

Original Research Article

Frquency of HCV, HBV, and HIV co-infection in Khorramabad, Iran, in 2013

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 is major public health concerns. Because of shared routes of transmission, HIV-HCV coinfection and HIV-HBV coinfection are common. HIV-positive individuals are at risk of coinfection with HBV and HCV infections. The prevalence rates of coinfection with HBV and HCV in HIV-patients have been variable worldwide depending on the geographic regions, and the type of exposure. and low number of studies in this field in Iran, specifically in Lorestan province, this investigation attempted to study the prevalence of these three viruses in one of the medical educational centers of Lorestan province.

Study design: This cross-sectional is a statistical study to determine the prevalence of concurrent viral infection in the city of Khorramabad, Iran.

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

Methodology:

This cross-sectional study was done in 2013 in order to study the prevalence of co-infection among 500 outpatients and inpatients referring to Shohadaye Ashayer Hospital, Khorramabad, Lorestan province. The existence of specific antigen and antibody against the virus was determined by ELISA. 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:

The aim of this study was to determine the prevalence of HIV, HBV and HCV co-infection in hospitalized patients and outpatients who were admitted to Khorramabad Shohadaye Ashayer Hospital. The patients with both hepatitis B and C infection suffered from some complications when they were infected with HIV co-infection. According to Chi-square test, there was a significant relationship between hospitalization of patients and prevalence of co-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 tuberculosis 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 our country 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 CD₄s (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 Shohadaye Ashayer Hospital, Khorramabad, Iran, in 2013.

2.METHODOLOGY:

This research was a cross-sectional study. 500 serum samples of outpatients and inpatients referring to ShohadayeAshayer Hospital, Khorramabad, Lorestan province, in 2013 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 (Ireland) for antibody. Sampling was conducted in 2013 at the request of the physician and patient satisfaction. This study was conducted primarily March through the end of February in 2013. 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

103 out of 500 studied samples were infected with HCV, HBV, and HIV viruses, 52 female and 51 patients 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).

3 (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.

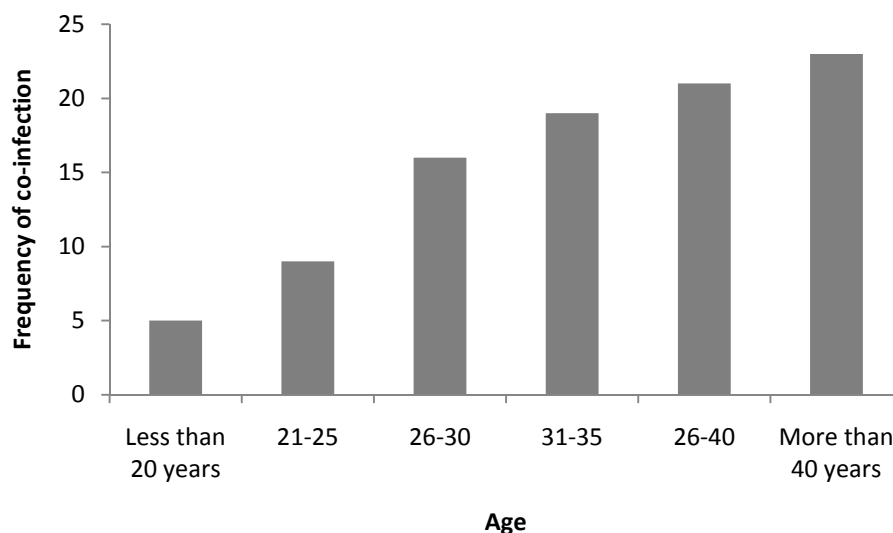


Fig.1. Studying co-infection prevalence in patients with HIV/HBV/HCV co-infection in the age range of less than 20 to more than 40 in ShohadayeAshayer Hospital, Khorramabad, Lorestan province, iran

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
Female	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 complications (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). 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.

Acknowledgment:

The authors would like to express their gratitude to the respectable head and colleagues at Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, for their sincere cooperation. We also appreciate all the people who helped us in this project.

Competing interests:

The authors declare that they have no competing interests.

REFERENCES:

162

1. Adewole OO, Anteyi E, Ajuwon Z, Wada I, Elegba F, Ahmed P, et al. Hepatitis B and C virus co-infection in Nigerian patients with HIV infection. J Infect Dev Ctries 2009 1;3(5):369-75.

2. Pourazar A, Akbari N, Hariri M, Yavari F, Akbari Sh. Evaluation of demographic Profiles and Prevalence of major Viral markers in first time vs repeat blood donors in Esfahan. SJIBTO, 2006; 2(7): 323-329.

3. Jaiswal SP, Chitnis DS, Naik G, Artwani KK, Pandit CS. Prevalence of Anti-HCV in central India. Indian J Med Res 1996; 104:177-81.

4. <http://www.unaids.org/en/resources/campaigns/globalreport2013>

5. Garfein RS, Vlahov D, Galai N, Doherty MC, Nelson KE. Viral infections in short-term injection drug users: the prevalence of the hepatitis C, hepatitis B, human immunodeficiency, and human T-lymphotropic viruses. Am J Public Health 1996; 86:

177

6. Hollinger FB, Purcell RH, Gerin JL. Viral Hepatitis. Philadelphia: Lippincott, Williams & Wilkins: 2002.

7-Okada S, Taketa K, Ishikawa T, Koji T, Swe T, Win N, et al. High prevalence of hepatitis C in patients with Thalassemia and patients with liver diseases in Myanmar (Burma). *J Acta Med Okayama* 2000; 54(3):137-8.

8-Ardalan FA, Osquei MRF, Toosi MN, Irvanloo G. Synergic effect of chronic hepatitis C infection and beta thalassemia major with marked hepatic iron overload on liver fibrosis: a retrospective cross-sectional study. *BMC Gastroenterol* 2004; 4:17.

9-Mannucci PM. Hemophilia and related bleeding disorders: a story of dismay and success. *Hematology(Am. Soc. Hemato.Educ. program, 2002: 1-9.*

10-Koziel MJ, Peters MG, Viral Hepatitis in HIV infection. *N Engl J Med*, 2007;356(14); 1445-1454.

11-Banafsheh Moradmamdi, SeyedAhmadSeyedAlinaghi, Reza Chaman and et al, Frequency and Correlates of Co-Infection Hepatitis C and Hepatitis B with HIV, *Knowledge & Health* 2011;6(3):40-43

12-Mohsen Mohammadi, Gholamreza Talei1, and et al, Survey of both hepatitis B virus (HBsAg) and hepatitis C virus(HCV-Ab) coinfection among HIV positive patients, *Virology Journal* 2009; 6:202

13-Amitis Ramezani, Mohammad Banifaz and et al Occult hepatitis B virus infection: A major concern in HIV-infected patients Occult HBV in HIV, *Hepat Mon.* 1, 2011; 11(1): 7–10.

14-Afarin Rahimi-Movaghar, Emran M. Razaghi, Elaheh, Sahimi-Izadian, Masoumeh Amin-Esmaili HIV, hepatitis C virus, and hepatitis B virus co-infections among injecting drug users in Tehran, Iran, *International Journal of Infectious Diseases*, 2010; 14, 28-33

15-Valdete MeurerKuehlkamp, FabianaSchuelter-Trevisol, Prevalence of human immunodeficiency virus/hepatitis C virus co-infection in Brazil and associated factors: The Brazilian Journal of Infectious Diseases, 17(4), 455-463

16-David K. Henderson, Managing Occupational Risks for Hepatitis C Transmission in the Health Care Setting, *Clin Microbiol Rev.* 2003; 16(3): 546–568.

17-Hadadi A, Haji Abdolbaghi M, Karbakhsh M, Rasoulinejad M, Mohraz M. The effectiveness of prophylaxis following occupational exposure to hepatitis B and HIV in medical professions. *Journal of Tropical Infectious Diseases* 2007;12(38): 33-38.

220 18-<http://khabaronline.ir/detail/286609/economy/market>
221
222
223 19-Hadadi A, Afhami SH, Kharbakhsh M, Hajabdoulbaghi M, Rasoolinejad M, Emadi H, et al.
224 Epidemiological determinants of occupational exposure to HIV, HBV, HCV, in health care workers. Tehran
225 University Medical Journal 2007;65(9): 59-66.

226
227 20-Maryam Yarmohammadi, Investigating the Serologic Status and Epidemiological Aspects of Health
228 Care Workers' Exposure to HBV and HCV Viruses, Knowledge & Health, 2011; 5(4): 37-42
229