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Prevalence of Hepatitis C Virus among Patients with Human Immunodeficiency and Its Association with Intra-Venous Drugs Addiction in Jeddah, Saudi Arabia

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ABSTRACT

Background: Despite extensive research on HIV and hepatitis C (HCV), there remains a gap in knowledge on the burden.

Objectives: to assess the prevalence of hepatitis C virus (HCV) among positive human immunodeficiency virus patients and to study the relationships between these infections and intravenous drug addiction.

Methodology: a cross sectional study has been conducted among total of 325 positive immunodeficiency patients (HIV) diagnosed to have HCV infection in the gastroenterology clinic at King Abdul-Aziz hospital and oncology center in Jeddah, Saudi Arabia between January 2015 and January 2016.

Conclusion: The high prevalence of these major virulent infections among drug addiction is a sign of a major public health problem. Other than complicating addiction illnesses of patients, they could play major roles in spreading these infections to other intravenous drug addictors.

Keywords: Hepatitis C virus - Human immunodeficiency virus - Intra-venous Drugs addiction.

INTRODUCTION

Hepatitis C virus (HCV) is a small enveloped positive strand RNA member of the Flaviviridae family [1]. Its infection is a major health issue as it often leads to chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC) and is the leading indication for liver transplantation worldwide [2]. In addition, the virus has also been implicated in a number of extra-hepatic "autoimmune" disease manifestations [1]. HCV-related autoimmune and lymphoproliferative diseases, including cryoglobulinemia and lymphomas, were documented soon after HCV discovery [3]. The current literature supports the view that risk of metabolic alterations, including hypercholesterolemia, insulin resistance, and diabetes mellitus, is increased in HCV infection [4].

Chronic hepatitis C (CHC) is a global problem with a variable prevalence in different countries [5]. It is estimated that 140-170 million individuals are chronically infected with the hepatitis C virus (HCV), and 3-4 million individuals are infected annually [6]. In Eastern Mediterranean countries there are about 21.3 million HCV infected patients [7]. Blood donor screening data indicates prevalence rates of 0.4%–1.1% [8]. Prevalence of hepatitis C virus infection (HCV) is high among people living with human immunodeficiency virus (HIV), with rates of up to 30% in some regions [9]. Considering these viruses, blood borne infections are transmitted efficiently through sharing of contaminated needles and other injection paraphernalia [10-13]. In the United States, approximately 9-12% of new HIV cases and 50% of new HCV cases are associated with illicit injection of drugs [14].

The diagnosis of HCV is based on detecting either anti-HCV antibody by enzyme linked immunosorbent assay (ELISA) or HCV-RNA by polymerase chain reaction (PCR) [15]. A study has been done show that HCV core antigen assays have been developed and they have a comparable sensitivity to that shown by the PCR-based assay, with a mean detection difference of one to two days [16-18]. HCV infections in the Kingdom of Saudi Arabia (KSA) were usually acquired as an outcome of the transfusion of infected blood products, before the implementation of blood donation screening programs [19]. However, the prevalence of CHC in the KSA has been diminishing steadily over the last decade as a result of these programs [19-20]. Furthermore, the use of polymerase chain reaction (PCR) techniques for screening blood donors is

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expected to enhance the reduction in the rate of HCV transmission in the future [21-22].

In this Study we aimed to assess the prevalence of HCV among HIV patients and to study the relationships between these infections and intra venous drug addiction.

Methodology

This was a cross section study designed to investigate the clinical and laboratory features among 327 Saudi patients whom previously diagnosed as HIV positive, presented in gastroenterology clinic at King Abdul-Aziz hospital and oncology center in Jeddah, Saudi Arabia, between January 2015 and January 2016. Age, number of admissions, education, marital and occupational status, and history of injecting drug has been assessed. Prevalence of HIV and HCV and the associations with history of drug addiction were evaluated.

Detection of HIV antigen and antibodies:

Detection of HIV antibody and the simultaneous detection of HIV-specific antigens and antibodies were performed using Abbott AxSym MIEA and Combo assay (Abbott Laboratories, USA) according to the manufacturer's recommendations. Positive results were confirmed by HIV western blot assay (DuPont Company, Wilmington, DE, USA) as recommended by the manufacturer.

Detection of anti-HCV antibodies/ core Antigen:

Anti-HCV antibodies were assayed by a third-generation ELISA kit (Axsym HCV version 3.0, Abbott Diagnostics, Chicago, Ill.) followed by the recombinant immunoblot assay (RIBA HCV 3.0) was used.

The study was done after approval of ethical board of King Abdulaziz Hospital & oncology center and an informed written consent was taken from each participant in the study.

Statistical Analysis

All statistical analyses were performed using SPSS version 24 (SPSS Inc., Chicago, IL, USA).

RESULTS

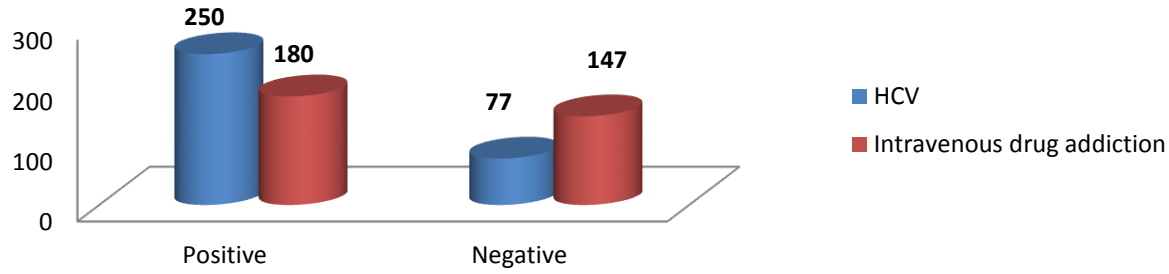
The sample of 327 participants was aged between 20 and 60 years and all were previously screened for HIV positive. Analysis of demographic and socioeconomic characteristics showed that most of the participants (49.8%) were divorced and had basic study (43.5%) or university of higher education (37.6%). Most were unemployed (42.5%) [Table 1].

Table 1: demographic characteristics.

Characteristics		**Number**	**Percentage**
Age	20 – 34	89	27.1%
	35 – 49	176	53.8%
	50 – 60	62	18.9%
Marital status	Single	114	34.9%
	Married	50	15.3%
	Divorced	163	49.8%
Education	Illiterate	62	18.9%
	Basic study	142	43.5%
	University Education or higher	123	37.6%
Occupation	Unemployed	139	42.5%
	Student	32	9.8%
	Governmental employee	78	23.9%
	Private sector employee	13	4.0%
	Retired	65	19.9%

Screening results revealed that 260 (79.51%) of the participants were HCV antibody seropositivity. Moreover, there was an overall statistically significant association between the presence of HCV and age, level of education, and occupation. More specifically, it was associated with age range (for those aged 35 - 49 years, $p<0.01$) and education (Illiterate $p<0.01$). It was also associated with those who were unemployed ($p=0.001$) while it was significantly protective (negatively associated) with those who were students: $p<0.0001$. In the other hand our statistical result support that HCV are strongly associated with HIV patients with history of intravenous drug addiction, ($p<0.01$)

Figure 1: The association between HCV and Intravenous drug addiction



DISCUSSION

These results show a high prevalence of HCV among HIV positive with strong association to intravenous drug addiction. In detection of HCV False negative anti-HCV EIA results may occur in HIV-infected persons with advanced immune suppression (CD4 < 100/mm3) and true negative EIA are common in the setting of acute HCV infection (< 12 weeks following acquisition) prior to seroconversion [23-24]. If serologic test results are negative and HCV infection is suspected due to elevated liver enzyme levels or risk factors such as intravenous drug usage or high-risk sex, HCV RNA testing should be performed. While a single detectable HCV RNA result is sufficient to confirm the diagnosis of active HCV infection, a single negative result cannot exclude active viremia because RNA levels might transiently decline below the limit of detection. However, in Saudi Arabia, the prevalence's of HIV and HCV infections are low. Compiled registered cases of HIV for one decade (2000-2009) including 2,956 cases only 15 cases were positive, while HCV seropositive prevalence is approximately 0.4-1.1% among Saudi blood donors [25-29]. It is well known that most drug use behavior starts in adolescence, implying that most study patients began injecting drugs in the late 1990's or later, a period when a well-established health service existed in Saudi Arabia. Unfortunately, the high infection rate reflects a shortcoming in the prevention of infection in such patients and in planning for good public heath prevention strategies through harm reduction and other preventive measures. The high infection rate is complicated by high rates of unemployment and low levels of education, which are common characteristics of addiction patients and present challenges in providing good intervention for them. Prevention of such transmission is of paramount importance.

Unfortunately, there are no harm reduction or opioid substitution programs in Saudi Arabia. Furthermore, Saudi addiction treatment centers have strict protocols of screening all patients for these infections, yet infection control and intervention programs for those who test positive in these centers remain to be evaluated. Addiction treatment programs should include preventive educational activities to help patients learn about prevention of these infections. Staff and those who work with infected patients should have special training in protecting themselves and other patients. Although this study emphasizes the high prevalence of HCV among HIV patients and its association with intravenous drug addiction, it is well known that these infections are common among non-injecting users as well.

Limitations

This study population was restricted to inpatients, and this limits generalization of the findings to the community. Furthermore, it is not clear that these infections are primarily the results from heroin injection as it is not uncommon for patients of this type to be involved in other risky behaviors and to ignore protection measures.

CONCLUSION

The high prevalence of these major virulent infections among drug addiction is a sign of a major public health problem. Other than complicating addiction illnesses of patients, they could play major roles in spreading these infections to other intravenous drug addictors.

RECOMMENDATIONS

Drug addiction habits should be studied in the community to build good harm-reduction strategies and prevention control programs, activities, and education in addiction treatment centers.

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