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## The Prevalence of Hepatitis B, Hepatitis C and HIV Infections in Non-IV Drug Opioid Poisoned Patients in Tehran-Iran

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**Abstract:** The present study intends to look into the prevalence of these infections in the non-IV drug abusing addicts whom were treated at our center. A pilot study was conducted on 20 patients who were admitted in poisoning center of Loghman-Hakim Hospital in Tehran due to non-IV drug overdose. One positive HIV antibody and one positive HBS antigen cases were found in this group. The pilot study was later expanded to a descriptive cross-sectional study on 214 patients. In this study 196 patients (91.6%) were male and 18(8.4%) were female. The average age of subjects was 37.9, having the highest frequency between 20 to 30 years old. The study showed that 14.48% (F = 31) had positive HCV antibody and 1.86% (F = 4) had positive HBS antigen and 1.4% (F = 3) had positive HIV antibody in their blood serum. One hundred and forty three patients (66.8%), were poisoned through oral opium consumption, 24 patients (11.2%) through inhalation and 18(8.4%) both oral and inhalation. The remain; were IV-abuser or the manner of poisoning was unknown. This study signifies the need for heightened attention and preventive measures against the infection of the health care professionals by hepatitis C (HCV) virus.

**Key words:** Hepatitis B, Hepatitis C, HIV, opioid, non-IV drugs abuses

### INTRODUCTION

Transmission of infections from hospitalized patients to their healthcares is an important problem which needs excess attention to it.

We have conducted this study to estimate the frequency of Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and HIV infection among non-IV drug opium poisoned patients so as to identify groups and areas requiring special attention for the prevention of occupational transmission of bloodborne infections. As there is less attention on non-IV drug abusers because of their minus risk of infection than IV-abusers, the risk of occupational exposure may be rise in health care staves.

Hepatitis C infection, as well as Human Immunodeficiency Virus (HIV) and Hepatitis B infections is transmitted by parental and non-parental routes. Hepatitis C is prevalent in IV-drug abusers, multiple sex partners and the people who pierce tattoos on their bodies. Also it's rates are higher in non-injecting drug users (NIDUs) than general population estimates. Whether this elevated HCV rate is due to drug use or other putative risk behaviors remains unclear. Non-

commercial tattooing may be a mode of HCV transmission among NIDUs. The same phenomenon happens with hepatitis B. One quarter of new HIV infections are secondary to injection drug use (Anonymous, 2005). IV injection is the main cause of HIV transmission 85% seconded by sexual transmission 10% (Tran *et al.*, 1998).

One study in New Jersey shows that 9.6% of non-injection drug users were positive for one or more markers of HIV, HBV and HCV (Gocke *et al.*, 2005). HIV incidence and prevalence in IV-drug users has declined in recent years, but HCV remain endemic in this population. HCV antibody prevalence among non-injection users of drug such as heroin and cocaine is between 5 and 30% (Hagan *et al.*, 2005). The prevalence of HIV is different across the pattern of drug use, 57.1% of injection drug users are HIV positive in spite of 11.7% of infrequent cocaine, alcohol or marijuana users (Pechansky *et al.*, 2006). The spread of anti-HCV antibody has been reported as 54% among IV drug abusers, 33% among non-IV drug abusers. The prevalence of HBV has been reported as 26% among IV drug abusers and 33% on non-IV drug abuser (Crofts *et al.*, 1997; Hamers *et al.*, 1997; Maayan *et al.*, 1994).

In a study carried out in France on 270 patients, 33% of them were opium addicts, 1% was HIV positive, 11.2%

were HBV positive and 30% were HCV positive. The same items in non-drug abusers were 0.6, 9.9 and 6.4%, respectively (Claudon-Charpentier *et al.*, 2000). In a study on the prevalence of HIV, HBV and HCV on 1035 opium addict patients, 15% of them were HIV positive, 73% had HBC antibody and 82% of them were HCV positive. The prevalence of these infections is dependent on the duration of addiction (Steffen *et al.*, 2001). There is a report of 75.3% HCV positive in IV-drug abusers who were on opioid replacement therapy (Richard *et al.*, 2005). The incidence of HCV infection seems to be doubled over the last decade (Law *et al.*, 2003).

Considering the fact that the majority of the patients hospitalized in the poisoning ward of Loghman Hakim Hospital, Tehran, Iran, are IV and non-IV drug addicts or those who have committed suicide, the high probability of these patients being infected considering is worth pondering on. The present study is intended to detect the spread of AIDS, Hepatitis B and in C in overdosed opium poisoned, whether non-intravenously or through inhalation admitted to our center. Since the Hepatitis C vaccine and anti hepatitis C immunoglobulin are not available and an expensive price of prophylaxis against HIV needle stick infected cases and also Anti HBV immunoglobulin, there is a necessity for some information regarding the prevalence and the range of transmissions risk of these infections.

There are some studies in our country about the prevalence of HBC, HBV and HIV but unfortunately there is no coordination between the results (Talaie, 2006; Alavian *et al.*, 2005). There are other studies on HIV prevalence in patients who need hemodialysis, in poisoned patients while there is no routine screening for HBV, HCV and HIV at our center (Taremi *et al.*, 2005).

To explore the importance and the risk of transmission of HBC and HBV and HIV through admitted patients poisoned by opium, the sero prevalence of these three items have been determined in non IV drug abuser which would in turn show us the requirement of prophylactic measures.

## MATERIALS AND METHODS

**Study population:** Between Sep. 2004 and Sep. 2005, a study of HBV, HBC and HIV seroprevalence was conducted at Loghman Hakim poisoning center. During this period, we study on the total admitted opium poisoned patients in the ward and ICU of poisoning center that included both conscious and unconscious patients. The cases were selected by sequential sampling. The data was collected using questionnaire, clinical examinations and laboratory findings. The history of infectious disease like hepatitis B and C and HIV, the history of being prisoner and also IV drug consumption

(abuse) was asked in the questionnaire and the cases, who have conducted positive answer, were eliminated from study. The questions were designed to assess basic demographic information, a history of previous chronic disease, the manner of opium consumption (inhalation or oral), the volume of drug abuse, age, sex, date of admission, phone number and also the place of admission (ICU or ward). The first 12831 persons enrolled were then selected for analysis of antibody of HCV, HIV and Ag of HBS from this group. Those opium poisoned subjects were selected out of which those who intravenously abused or those whose questionnaire remained incomplete were excluded from the study. At last 214 samples were remained.

**Laboratory methods:** Testing for antibody to HCV was done by a commercially available first-generation EIA; serum specimens repeatedly reactive by EIA were tested using a supplemental neutralization assay. Participants were considered to be anti-HCV-positive if their sera were repeatedly reactive for anti-HCV on EIA and positive for anti-HCV on the supplemental neutralization assay.

A commercially available EIA was used to analyze serum samples for antibodies to HIV. Serum samples were tested for HBS-antigen.

**Statistical analysis:** In this study the volume of samples were statistically analyzed considering a 3% error margin and 95% confidence interval, according to the country's latest statistics which included 7600 subjects in HIV Ab (the last report of control diseases center of health ministry in spring of 2006 is 13000 subjects), for hepatitis B is 3.5% and in hepatitis C which we had no statistics documented.

## RESULTS

In this study from 12831 patients who were admitted from Sep. 2004 till Sep. 2005 in Loghman poisoning center 214 opium poisoned patients were selected which 185 cases were consumed orally or through inhalation or together and 21 cases were IV-drug abuser which was realized at the end of study and 8 cases were unknown. Among the 214 remaining patients, 196(91.6%) were male and 18(8.4%) were female. This shows that, the prevalence of men is virtually more than women.

The average age of subjects was 37.9 with standard deviation 14.95. The youngest was 16 and the oldest was 87 years old. The highest frequency belongs to 20-30 years old patients.

Fever was detected in 59 patients (27.6%), leukocytosis in 121 cases (56.5%). We found 143 patients, who were poisoned through oral consumption (66.8%) 24 patients (11.2%) through inhalation and 18 (8.4%)

**Table 1: The prevalence of HCV Ab, HBS Ag, HIV Ab in opium poisoned patients in Loghman-Hakim Hospital**

	HCV Ab		HIV		Hbs Ag	
	Patients	Percentage	Patients	Percentage	Patients	Percentage
+	31	14.48	3	1.4	4	1.86
-	138	64.48	208	97.66	209	97.66
Unchecked	45	21.02	3	0.46	1	0.46

both oral and inhalation. In sequence of the study we found 21 patients who were IV-abuser that because of some problems like unconsciousness in their admission time we could not separate them in the beginning of the study. The manner of use in 8 (3.7%) patients was unknown. There were 31 HCV positive cases (14.48%) and 45 cases were not checked because of some problem in sampling. Four cases were HBS-Ag positive (1.86%) one case was not determined. Three cases were HIV-Ab positive (1.4%) and 3 cases was not determined (Table 1).

More data in the research process: 121 patients were conducted leukocytosis (WBC more than 11000) and the average of WBC count was 13318 with Standard deviation 12557. 59(27.6%) patients had more than 37.8 C body temperature and 155(72.4%) patients had normal temperature. The average was 37.55 with Standard deviation 0.789. Also 126 patients have past history of opium addiction.

## DISCUSSION

HIV is the ethiological factor of AIDS which belongs to the family of retroviruses and the sub-taxonomy of Lentiviruses. As a global pandemic, it is estimated that 37 million adults are inflicted with AIDS, most of whom; are the African Sub-Saharan (50%). HIV is transmitted through homosexual and heterosexual contacts, blood and its by-products, from the infected mother to the child during pregnancy, delivery or lactation (UNODC., 2005). Extensive studies has shown that the risk of HIV transmission to an uninfected person through the cuts by needles or sharp objects which had already been in contact with the blood of proven HIV infects is 0.3% while this risk is 0.09% through the contact with mucus membrane.

The 2003 United Nations Program on HIV/AIDS (UNAIDS) reported 5 million new cases of AIDS infection (i.e., 14000 daily) and 3 million AIDS related death which categorizes AIDS as the 4th cause of death globally.

The HIV infects in the present study were also infected with HBV, i.e., 3 HIV positives were also infected with HBV as well as HCV Ab positive.

There is proven recorded, yet little, professional danger for those who are in close contacts with HIV. That encompasses all health care professionals such as

doctors, dentists, nurses, lab technicians, etc. The danger becomes more when they need to work with sharp objects. It is estimated that 600000-800000 of health care professionals get cut with needle or sharp medical tools annually. The American Centre for Control and Prevention of Disease (CDC) estimated that there are 300000 HBV primary infections annually in the United States. 100000 hepatitis B cases are hospitalized annually, 300 of whom die due to fulminant hepatitis. Approximately 750000 to 1000000 Americans are HBV carrier (UNODC., 2005). The prevalence of HBV carrier in the world varies between 1-15% and in the Middle East, is 2-7%. In Iran prevalence of HBV was decreased from 3 to 1.7% through the recent 5 years as a result of active HBV vaccination program (Talaie, 2006).

In the present study, only 4 out of 214 samples were positive HBS Ag (1.86%); 3 of these were also HIV positive. Before this study a pilot study was conducted on 20 patients who were admitted in poisoning center of our hospital in Tehran due to drug overdose. One positive HIV antibody and one positive HBS antigen cases were found in this group.

Many of the hepatitis B infects in the United States are young adolescents, the majority of whom are males. In the present study, out of 4 HBS-Ag positive patients, only one of them was female the remaining 3 were males. It is estimated that around 4 million Americans (1.8% of the overall population) have tested positive against HCV Ab. Also the study shows that one out of five patients who are visited in emergency center has a positive HCV-Ab in their serum samples (Talaie, 2006). Study study also shows that out of 214 patients under investigation, 31 cases were positive HCV-Ab (14.48%). Due to the lack of coordination with the lab, the possibility of checking 45 patients against HCV Ab became void.

In some parts of the United States 85-100% of IV-drug abusers are HCV infects. The HCV positive subjects in our study also had history of addiction. Three of these subjects were IV drug abusers (9.67%).

Moreover, the overdose method (oral, IV or through inhalation) in 8 of the subjects couldn't be established. 31 out of the total of 214 were HCV positives (14.5%), 4 were HBS Ag positives (1.86%) and 3 were HIV positives. (1.4%). The study also pointed out that the spread of

hepatitis C was more than the spread of hepatitis B and AIDS in the patients overdosed orally or through inhalation.

In this study 126 subjects were drug addicts, 17 of whom were HCV positives, 2 were HBS Ag positives and 2 were HIV positives. Considering that, it can be concluded that the drug addicts in Iran mostly become HCV infected.

Considering that, in our pilot study, there were 1 HBS Ag positive non-IV drug abuser and 1 HIV-Ab positive non-IV drug abuser, the study was decided to be extended.

It must be considered that we could not separate the roll of sexual transmission of these infections; it seems that there is not a high risk of transmission with HIV and HBV through non-IV drug abusers to personnel of medical centers but the risk of HCV is still high.

No similar studies concerning the two categories of oral drug abusers and abuse-through-inhalation was found in the last 15 years (1991-2005).

Hepatitis C is a blood borne pathogen that can be transmitted through exposure to infected blood. Although the risk of occupational infection by hepatitis B has been greatly reduced through immunization and the risk of HIV infection can be reduced through post exposure chemoprophylaxis, no such opportunities exist for the hepatitis C virus-(HCV) exposed worker at this time. Therefore, there has been considerable attention and concern regarding the occupational risk of HCV infection. Because a significant proportion of HCV infections are occult and are often diagnosed in individuals who recall no specific risk behavior (Henderson, 2003).

The Centers for Disease Control and Prevention (CDC) cites a risk of anti-HCV sero conversion after a percutaneous exposure from an HCV-positive source of 1.8% (range, 0-7%), whereas seroconversion proportions of 0% to 10% have been reported in the literature after the percutaneous exposure of healthcare workers to a known HCV-positive source. There is a meta analysis of 25 longitudinal or prospective studies of parenterally exposed healthcare workers demonstrated a pooled sero conversion proportion of 1.9% (Steffen *et al.*, 2001; Beltrami *et al.*, 2000).

The estimated risk of transmission of blood borne infections after per cutaneous exposure in healthcare workers is calculated to be 0.2-0.5% for HIV, 2-40% for HBV and 1.8-10% for HCV (Kordi *et al.*, 2004). This signifies the need for heightened attention and preventive measures against the infection of the healthcare professionals by hepatitis C virus.

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