

Study on infectious causes of hospitalization in intravenous drug users

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Abstract: To evaluation of common infections in Intravenous drug users (IVDU). In a descriptive-analytical study that performed in Infection Diseases and Tropical Medicine Research Center of Tabriz form 2001-2011, 64 patients (63 male & one female) with IVDUs and had infectious signs were enrolled in to the study. The mean age of studied patients was 37.05±9.35 years. Heroin was the principle drug consumed by 78.125% of IVDUs. The most common chief complaints of patients were referring to liver biopsy, cough and pain with 21.87%, 20.31% and 20.31%, respectively. The most involved organs were liver (31.25%), lung (25%) and lower extremities (18.75%). Hepatitis 29.68%, skin infections 23.43%, pulmonary infections 21.87%, peripheral vascular infections 15.62%, AIDS 4.68%, endocarditic 1.56%, epididimorchitis 1.56% and drug toxicity 1.56% were the infectious etiologies of hospitalization in IVDUs. The most infections cause of IVDU hospitalization was hepatitis, skin infection and pulmonary infections.

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1. Introduction

Addiction is one of the important problems in today's world. Annually, about 5 percent of the world's population, Equivalent to 200 million people, uses narcotics (White and Comiskey, 2007). Annual statistics by World Health Organization show an increase of injecting addicts worldwide especially in developed countries (Hosseini, 2011). There were approximately 13 million injecting addicts in the world about 78 percent of which are in developed countries (Hughes and Rieche, 1995). There are different ways of using narcotics that injecting is one of the most dangerous ways; because this way of using narcotics leads to increased susceptibility to, and metastasis of infectious diseases including AIDS, hepatitis and other bacterial infections (Palepu, 2001). Due to certain behaviors in the patient group, there is a possibility of simultaneous existence of several diseases in individuals, which leads to variation in their clinical symptoms (Mandel, 2010). Diagnosis and treatment of patients with injecting addiction is also very difficult due to various reasons including existence of non-infectious causes of fever such as toxins and impurities in the narcotics, self-treatment before referring to a doctor, having HIV infection and related diseases, inappropriate use and

arbitrary cut off of medications (Samet, 1990). Due to low acceptance of patients for treatment, mortality and morbidity in these patients are high. Infectious complications in injecting addicts are related to their environment and lifestyle (Mandel, 2010). Powder narcotics are dissolved in saliva or some water from any source, and injected by any available syringe into the vein or under the skin. Skin is not disinfected either, and is cleaned just by rubbing some saliva. In case of using a common syringe, some blood remains in the syringe and needle which is just diluted but not completely removed by rinsing with water; and in frequent use, this offers the best medium for transmission of infectious pathogens(Mandel, 2010). Given the importance of infections, especially metastatic ones in injecting addicts, and annual increase of the number of injecting addicts, this research has been conducted to determine the most common infections in this group of patients, in order to prevent the rate of infection and transmission of various diseases in the people at risk and also reduce disease mortality by the knowledge of the prevalence of infections and their complications, and with the diagnosis and treatment in one hand and changing patients' habits and behaviors through counseling on the other hand.

2. Material and Methods

In a cross - sectional descriptive-analytic study on injecting addicts admitted in infectious centers of Tabriz in 9 years during 2001-10, 64 out of 80 injecting addict cases, suitable for the purpose of the study were selected and evaluated. Reviewing of clinical records of the patients, Necessary information was extracted. Variables under study has included: gender and age, type of injecting addiction, period of injecting addiction, the main complaints of patients, the status of acute phase responses, precise anatomic localization of lesion, criteria and evidences leading to the diagnosis, hospitalization period, and anti-biogram culturing results, status of screening for HBV, HCV, HIV infections, number of previous hospitalization, hospitalization costs, and procedure of discharge.

Table 1. Infections cause to hospitalization of patients.

Causes of hospitalization		Percent of frequency	Cumulative Percent
Skin and soft tissue infections	Cellulitis	17.18	23.43
	Abscess	4.68	
	Necrotizing fasciitis	1.56	
Pulmonary infections	Pneumonia	17.18	21.87
	Tuberculosis	1.56	
	Lung abscess	1.56	
	Empyema	1.56	
Peripheral vascular infections	Septic thrombophlebitis	1.56	15.62
	Hematoma	1.56	
	Thrombosis (DVT)	12.5	
Hepatitis	Viral hepatitis C (HCV)	21.87	29.68
	Viral hepatitis B (HBV)	7.81	
Endocarditic		1.56	1.56
Epididimorchitis		1.56	1.56
AIDS		4.68	4.68
Drug Fever		1.56	1.56

3. Results

In this study, 63 male patients and one female patient with injecting addiction were studied. Mean age of patients was 37.05 ± 9.35 in the range of 31-40 years. Addiction to heroin with 78.125% was the most common injecting drug in the addicts under study, and morphine with 9.37% was the next. Duration of addiction was 3 to 9 years with morphine and up to 12 years with heroin. During

hospitalization, 40.62% of addicts were febrile, 29.68% were leukocytosis and 35.93% had increased ESR. The main complaints of addicts under study are shown in Figure 1. Precise anatomic localization of lesions in the studied addicts is shown in Figure 2.

3.125% of studied addicts were HIV-positive, 6.25% HBV-positive and 37.5% HCV-positive; the screening status of HIV, HCV and HBV is shown in Figure 3. Mortality rate of the addicts under study was 10.93%; 18.75 % were discharged with complete remission and 70.31% with partial recovery, and mean admission fee was \$121 per person.

Six of the patients studied had a history of hospitalization in the infection center. Most common infections among the addicts under study was hepatitis in 19 and dermal infections in 15 patients; detailed infections of the addicts under study are shown in Table 1.

4. Discussions

Due to certain behaviors, injecting addicts are susceptible to various infections. Among the underlying causes of infection in injecting addicts, the increase of *Staphylococcus aureus* as the normal skin flora, mucosa and nasopharynx, non-sterile injection techniques, use of contaminated equipment or injection drugs such as infected syringes or solvents, suppression of immunity due to HIV infection or use of narcotics, poor oral hygiene or impaired gag reflexes and cough caused by drug use, low socio economic condition, and sometimes, homelessness which exposes the addict to certain pathogens such as TB bacilli can be mentioned (Mandel, 2010).

Among the most common infections in patients with injecting addiction, hepatitis with frequency of 32.7% was on top of the list in the current study, and among the types of hepatitis; hepatitis C with the prevalence of 23.1% was higher than all the other cases. In other studies, the prevalence of hepatitis C in injecting addicts reported high too (Young and Cheong, 1997; Devi, 2005).

Hepatitis is considered as a common complication of drug injection, and viruses are known as the only factor of hepatitis in addicts. Studies by Lee & Lemon indicate that simultaneous infection of Hepatitis B and D was more common in addicts often demonstrating as Fulminant form of hepatitis that leads to complete recovery for either viruses or death.

Vaccination against hepatitis B in addicts protects them from both viruses (Lemon and Thomas, 1997; Lee, 1997). A study by Novick et al also showed that injecting addicts make about 42 percent of patients with hepatitis C and often they proceed towards the chronic hepatitis (Novick and Reagan, 1997).

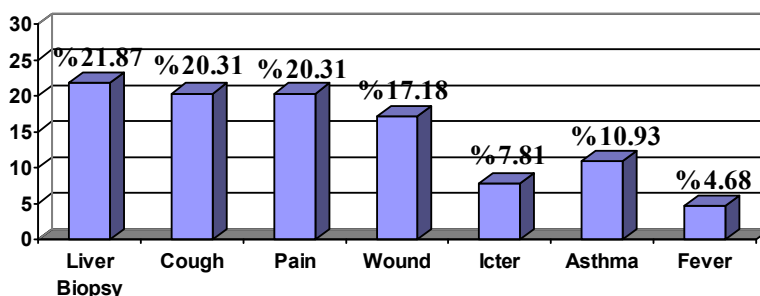


Figure 1. The most common chief complaints of patients

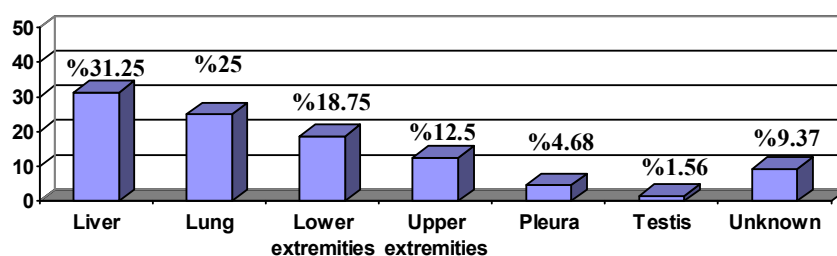


Figure 2. The most involved organs in the studied patients

As observed, the results by our study are in agreement with most other studies that seem to be due to use of contaminated shared syringes and the same risky behaviors among injecting addicts in different countries. Skin and soft tissue infection with 22.3% was the second most common cause of hospitalization of addicts.

In many other studies, this factor was the most frequent cause of reference of admitted addicted patients, and if outpatient centers were included in the study, it seems that most of the cases were related to skin and soft tissue infections, where, due to the superficiality of cases and outpatient treatment, or no consent of patients to get admitted, the admitted cases only include cases with deep infection and extensive gangrene or with poor general condition of the patient. From among skin and soft tissue infections, cellulitis with 66.7%, abscess with 25.1%, and necrotizing Faceit with 8.2% were of the important infections. In a study by Takahashi et al. patients with cellulitis were in a higher need for admission in comparison those with abscess(Takahashi, 2003), the fact which is in agreement with our study. Susceptibility to skin and soft tissue infections was due to repeated injections in the same area without disinfection, which leads to local ischemia and necrosis in the area. On the other hand, use of some substances as a solvent also increases the risk of

infection, this substances cause the release of norepinephrine and vascular spasms which lead to damage to entimaic vascular parts followed by vascular thrombosis and tissue infection. Skin and soft tissue infections vary from a simple abscess or cellulitis to life-threatening infections such as septic thrombophlebitis and fascia infection (Mandel, 2010).

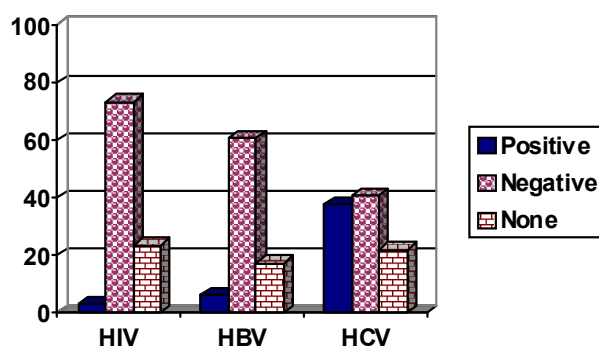


Figure 3. Screening of HIV, HBV and HCV between patients

The pulmonary infections with incidence of 19.3% were the third cause of reference of addicts, the most common of which were pneumonia and then, tuberculosis, lung abscess, and empyema with lower percentages. In similar studies, the most common pulmonary infections have been due to common pulmonary pathogens causing pneumonia (Fauci, 2008). Next to cellulitis, pneumonia has been the most common infection in injecting addicts which should be diagnosed by pulmonary emboli septic from right heart or peripheral vascular origin (Fauci, 2008). The most common pathogens of Pneumonia were *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Pseudomonas aerogenosia* respectively, which cause disease by hematogen. Lung abscess and necrotizing pneumonia are their other pulmonary demonstrations (Mandel, 2010). Pulmonary infections in injecting addicts are due to reduced clearance of secretions, aspiration, and reduced immunity, particularly along with HIV infection (Mandel, 2010). Pulmonary Tuberculosis is a major problem in injection addicts with and without HIV infection. Homelessness, poverty and bad conditions and unwillingness are some factors predisposing the disease (Mandel, 2010).

Peripheral vascular infections with 13.4% the fourth cause of reference of addicts and DVT with 71.6%, septic thrombophlebitis and hematoma, each with 14.2% were of the important factors. Due to the injection, Peripheral and central vessels suffer multiple damages as hematoma, thrombosis, septic thrombophlebitis, mycotic aneurysms and arteriovenous- intravenous traumatic fistula. In another study on young patients with DVT, it was found that they had a background of drug injection, and concluded that drug injection is an important cause of DVT in young patients (Syed and Beeching, 2005). In our study, DVT is involved with most cases and the results are similar to other studies. AIDS, with 5.8%, is another one of the infections in addicts that the potential cause of acquisition of HIV infection in injecting addicts is due to the use of shared syringe and unsafe sexual contacts is in this group (Mandel, 2010). Similar studies on HIV and its relation to drug injection have been conducted, that provided statistics indicates an increase in AIDS patients due to drug injection in recent years. Endocarditis with 1.9% is one another infection diagnosed in these patients; in the studies conducted in Isfahan, 0.5% of the addicts suffered endocarditis (Abdali and Faiiaz, 2005). Statistics obtained in studies of other countries have indicated endocarditis as one of the common infections in addicts (Young and Cheong, 1997) and the most common cause of drug injection addicts has been attributed to infective

endocarditis and the most common organism was related to *Staphylococcus aureus* (Mandel, 2010; Young and Cheong, 1997). The difference of prevalence in our study with other studies is due to the admission and treatment of patients with endocarditis in the heart wards. 1.9% of infection cases were due to epididymo-orchitis that its lower percentage in this study and no report of it in other studies suggests that this infection is probably not related to drug injection.

Conclusion:

All patients were male with mean age of 37 years. The most common drug injected was heroin with 92.3% and the commonest infections leading to admission were hepatitis, skin and soft tissue and pulmonary infections. Since most people are in sexually active age groups, there is a probability of transmission of sexually transmitted infections (STI) and particularly HIV also in the patients' partners and diagnosis and treatment of patients not only reduces morbidity and mortality, but also may help promotion of the community health.

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References

- 1- White E, Comiskey C. Heroin epidemics, treatment and ODE modelling. *Math Biosci* 2007;208(1):312-24.
- 2-Hosseini SA, Darbooy Sh, Tehrani Banihashemi SA, Naseri SM, Dinarvand R. Counterfeit medicines: report of a cross-sectional retrospective study in Iran. *Public Health* 2011;125(3):165-71.
- 3-Hughes PH, Rieche O. Heroin epidemics revisited. *Epidemiol Rev* 1995;17(1):66-73.
- 4-Palepu A, Tyndall MW, Leon H, Muller J, O'Shaughnessy MW, Schechter MT, et al. Hospital Utilization and Costs in a Cohort of Injection Drug Users. *CMAJ* 2001; 165:415-420.
- 5-Mandel GL, Bennett JE, Dolin R. Principles and Practice of Infectious Disease, 7 th ed. Churchill-Livingstone, Philadelphia, 2010; 3875-3890.
- 6-Samet JH, Shevitz A, Fowle J, Singer DE. Hospitalization Decision in Febrile in Intravenous Drug Abusers. *Am J Med* 1990; 89:53-7.

- 7-Young KY, Cheong I. A Study of Malaysian Drug Addicts with Human Immunodeficiency Virus Infection. *Int J STD AIDS* 1997; 8(2):118-23.
- 8-Devi KhS, Brajachand N, Singh HL, Singh YM. Co-Infection by Human Immuno Deficiency Virus, Hepatitis B and Hepatitis C Virus in Injection Drug Users. *J Commun Dis* 2005; 37(1):73-7.
- 9-Lemon SM, Thomas DL. Vaccines to prevent Viral Hepatitis. *N Engle J Med* 1997;336(3):196-204.
- 10-Lee WM. Hepatitis B Virus Infection. *N Engle J Med* 1997; 337(24):1733-45.
- 11-Novick DM, Reagan KJ. Hepatitis C Virus Serology in Parenteral Drug Users. *Addiction* 1997; 92:167-71.
- 12-Takahashi Ta, Mettill JO, Boyko EJ, Bradley KA. Type and Location of Injection Drug Use-Related Soft Tissue Infections Predict Hospitalization. *J Urban Health* 2003;80(1):127-36.
- 13-Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J. Harrison's Principles of Internal Medicine, 17th ed. MC Graw-Hill, New York, 2008; 2733-2736.
- 14-Syed FF, Beeching NJ. Lower-Limb Deep-Vein Thrombosis in a General Hospital: Risk Factors, Outcomes and the Contribution of Intravenous Drug Use. *OJM* 2005; 98(2):139-45.
- 15-Abdali H, Faiiaz L. Prevalence of Complication among Injection drug Abusers (IDAs) in Isfahan. *Pak J Med Sci* 2005; 21(3): 308-12.

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