

Infections in Intravenous Drug Users in the Perspective of Infectious Emergencies

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Abstract

Introduction; An increasing number of intravenous drug users are seen in now days. Intravenous drug users (IDUs) are a group of subjects who inject different drugs, generally in the extremities. This way of taking drugs, apart from leading to an addiction, on the other hand also serves as the possibility of taking or spreading infections.

The aim of this paper is to provide a brief overview of IDUs patients, who were presented to the emergency department of the infectious diseases service, and required further hospitalization, during the period January 2012 - December 2015.

Material and methods: The study is retrospective and was carried out in the emergency department of the infectious disease service and the infectious disease service as well. During the period January 2012 – December 2015, 26 patients were hospitalized in our hospital as IDUs. There were 20 male patients. The average age of the patients was 32 years. The main clinical symptoms were fever, dyspnea, chest pain, pain in the extremities, edema of the extremities, necrotic ulcers at the injection site, jaundice in the sclera, confusional state. The resulting diagnoses were viral infections (HIV/AIDS infection, viral hepatitis), septic conditions (endocarditis, fasciitis), skin infections (cellulitis, S. aureus infections), pulmonary infections.

Conclusions: Viral, bacterial and fungal infectious diseases are quite frequent among the people of this community. This is related to the way of life (poor social economic conditions, poor hygiene), risky sexual behaviors and the use of syringes from one person to another. The screening of this community is important to prevent any infectious disease.

Keywords: IDUs, infections, endocarditis, Staphylococcus aureus,

Introduction:

An increasing number of intravenous drug users are seen in now days. IDUs users are a group of subjects who inject different drugs, generally in the extremities. This way of taking drugs, apart from leading to an addiction, on the other hand also serves as the possibility of taking or spreading infections [1]. IDUs users are a group of

patients vulnerable to a wide range of infections, often life-threatening. The spectrum of infections in these subjects is quite wide, starting from skin infections, sexually transmitted infections, viral hepatitis, and even sepsis [2–5]. Bacterial infections are the most common in these subjects, since sterilization/disinfection methods of the injection site are not used during needle manipulation [6,7]. Cutaneous infections can range from cellulitis, erysipelas, over-infected necrotic ulcers, and deeper infections such as fasciitis. This is the result of damage to the veins, to the integrity of the skin (from both toxic materials and microbes on the surface of the skin). The injection sites are also the areas where infections occur most often, for this reason the extremities are the part of the body where they are found most often [8,9]. Also, these subjects are predisposed to pneumonia and pulmonary embolism, which are usually accompanied by septic conditions and endocarditis, generally on the right side

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[6,10,11]. Viral infections such as viral hepatitis or even HIV are an important place, especially in underdeveloped or developing countries. The use of syringes between each other is the main way of spreading viral infections, and risky sexual behavior predisposes these patients to sexually transmitted infections [10].

Regardless of the type or microbiological cause, the main reason that forces these patients to seek medical help is fever. These patients are often complicated with socio-psychologic problems, so they prefer not to go to the structures of the health system according to its links, but prefer to see the doctor directly in the emergency medical services. It is estimated that mortality in IDUs is almost 22 times higher compared to other non-drug users. The number of hospitalizations for patients who abuse intravenous drugs is not very high, and it is an indicator of many social problems, in most cases they refuse to be hospitalized or leave the hospital early without the doctor's permission. Their treatment is difficult not only medically but also psycho-socially [5,7,12,13].

Material and methods:

The study is retrospective and was carried out in the emergency department of the infectious disease service and the infectious disease service. During the period January 2012 – December 2015, 26 patients were hospitalized in our hospital as intravenous drug users. There were 20 male patients. The average age of the patients was 32 years old. The main clinical symptoms were fever, dyspnea, chest pain, pain in the extremities, edema of the extremities, necrotic ulcers at the injection site, jaundice in the sclera, and confusional state. The resulting diagnoses were viral infections (HIV/AIDS infection, viral hepatitis), septic conditions (endocarditis, fasciitis), skin infections, and pulmonary infections.

Clinical sings	No. of Cases	Percentage
Fever,	20	77
Dyspnea	5	19
Chest pain	4	15
Pain in the extremities	17	65
Edema in the extremities	17	65
Skin ulcers	11	42
Jaundice	7	26
Confusional state	2	7

Table 1. Clinical presentations of IDUs

There were 15 patients with skin and soft tissue infections. Fasciitis of the lower extremities in the inguinal region resulted in 3 patients, while cellulitis and thrombophlebitis were evident in 8 patients. Pneumonia resulted from two patients. Osteomyelitis was confirmed in 1 case. Viral infections were present as below: 8 patients were diagnosed with chronic viral hepatitis B, 6 with viral

hepatitis C, and three cases resulted with HIV/HCV co-infection. Infectious endocarditis from *Staphylococcus aureus* was confirmed in 4 patients. Regarding to the microbiological diagnoses, *Staphylococcus aureus* was found to be present in 6 patients, four of whom had bacterial endocarditis. Mortality was 11.5% (3/26). 2 cases were with endocarditis of tricuspid valve and 1 case of osteomyelitis.

Discussion

IDUs are a risk factor for acute bacterial skin infections and these are the main causes of hospitalization among these patients. This is also observed in our study where 15/26 resulted in skin infections. In previous studies in IDUs with skin abscesses, methicillin-susceptible *Staphylococcus aureus* (MSSA) and *streptococci* were the most commonly identified microorganisms [9,13,14]. For moderate to severe abscesses, it is recommended to apply antibiotic therapy in combination with their drainage. It is also observed in our study that pulmonary infections occupy an important place in these patients. IDUs have a 10-fold higher risk of community-acquired pneumonia (CAP), including aspiration pneumonia and or even pulmonary tuberculosis compared to the general population. This is related to the use of tobacco, alcohol abuse and the way of eating and poor hygienic conditions. Organisms that commonly cause CAP in this group include *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Haemophilus influenzae*, and *Klebsiella pneumonia* [15–17]. Septic pulmonary emboli can occur from injection site infections and tricuspid valve endocarditis and usually present with high fever and symptoms suggestive of pulmonary embolism such as chest pain and shortness of breathiness [18,19].

The incidence of infective endocarditis (IE) has increased significantly in IDUs, probably because of better diagnostic possibilities. Most endocarditis in IDUs occurs on the right side, especially in the tricuspid valve, but EI of the aortic valve is not excluded. However, right- and left-sided infections occur with equal incidence in IDU. Infections from *Staphylococcus aureus* accounts up to three quarters of cases, followed by *streptococci* and, less frequently, bacilli and gram-negative bacteria. Septic emboli are common in IE caused by *S. aureus* and may involve the lung (right-sided IE) and kidney, brain, and bone [5,20,21].

The high-risk practice of using needles, syringes, and other drug injection equipment places IDUs at high risk for acquiring and transmitting HIV or even hepatitis B virus (HBV) and hepatitis C virus (HCV) infections. Furthermore, IDUs are exposed to significant negative risk environments that make them vulnerable dangerous behavior. IDUs makes up to 12% of newly diagnosed patients living with HIV and up to 60% of newly diagnosed with HCV or HBV infections in the United States, and there

has been a marked increase in HCV transmission directly related to the opioid epidemic and IDUs [10,11,22–25].

The limitation of our study is that it is focused only on our center, with patients who presented to the infectious diseases service. We did not manage to include in our study other centers such as regional hospitals or toxicology or pneumology service.

Conclusions:

Viral, bacterial and fungal infectious diseases are quite frequent among the people of this community. This is related to the way of life (poor social economic conditions, poor hygiene), risky sexual behaviors and the use of syringes from one person to another. Infectious pathologies such as endocarditis, fasciitis and osteomyelitis are true infectious emergencies and appear in the most severe form as a septic condition. Their treatment is difficult and not infrequently the results are not good, since the pathogenic agents are multiresistant to antibiotics. The screening of this community is important to prevent any infectious disease. The not very high number of admissions for patients who abuse intravenous drugs is an indicator of many social problems, in most cases they refuse to be hospitalized or leave the hospital early without completing the treatment, this leads to poor adherence even after discharge from the hospital.

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References

- Novak SP, Kral AH. Comparing Injection and Non-Injection Routes of Administration for Heroin, Methamphetamine, and Cocaine Uses in the United States. *J Addict Dis.* 2011;30(3):248–57.
- Workowski KA, Bachmann LH, Chan PA, Johnston CM, Muzny CA, Park I, et al. Sexually Transmitted Infections Treatment Guidelines, 2021. *MMWR Recomm Rep.* 2021 Jul 23;70(4):1–187.
- Smith PC, Page JB. Medication therapy among intravenous drug users (IDUs) with HIV infection. *AIDS Patient Care STDs.* 1996 Apr;10(2):101–10.
- Allen VB, Bechman K, Klein JL. Bloodstream infections in Injecting drug users: A 15 year prospective single-centre study. *Clin Infect Pract.* 2022 Nov 1;16:100159.
- De Rosa FG, Cicalini S, Canta F, Audagnotto S, Cecchi E, Di Perri G. Infective Endocarditis in Intravenous Drug Users from Italy: the Increasing Importance in HIV-infected Patients. *Infection.* 2007 Jun 1;35(3):154.
- riedman H, Pross S, Klein TW. Addictive drugs and their relationship with infectious diseases. *FEMS Immunol Med Microbiol.* 2006 Aug;47(3):330–42.
- McCarthy NL, Baggs J, See I, Reddy SC, Jernigan JA, Gokhale RH, et al. Bacterial Infections Associated With Substance Use Disorders, Large Cohort of United States Hospitals, 2012–2017. *Clin Infect Dis.* 2020 Oct 23;71(7):e37–44.
- Ebright JR, Pieper B. Skin and soft tissue infections in injection drug users. *Infect Dis Clin North Am.* 2002 Sep;16(3):697–712.
- Baltes A, Akhtar W, Birstler J, Olson-Streed H, Eagen K, Seal D, et al. Predictors of skin and soft tissue infections among sample of rural residents who inject drugs. *Harm Reduct J.* 2020 Dec 2;17(1):96.
- Farhadian N, Karami Matin B, Farnia V, Zamanian MH, Najafi F, Farhadian M. The prevalence of people who inject drugs among those with HIV late presentation: a meta-analysis. *Subst Abuse Treat Prev Policy.* 2022 Feb 10;17(1):11.
- Gokengin D, Oprea C, Begovac J, Horban A, Zeka AN, Sedlacek D, et al. HIV care in Central and Eastern Europe: How close are we to the target? *Int J Infect Dis.* 2018 May 1;70:121–30.
- Mortality among people who inject drugs: a systematic review and meta-analysis - PMC. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3605003/>
- Nguemini Tiako MJ, Mori M, Bin Mahmood SU, Shioda K, Mangi A, Yun J, et al. Recidivism Is the Leading Cause of Death Among Intravenous Drug Users Who Underwent Cardiac Surgery for Infective Endocarditis. *Semin Thorac Cardiovasc Surg.* 2019 Mar 1;31(1):40–5.
- Glynn JR, Moss PAH. Systematic analysis of infectious disease outcomes by age shows lowest severity in school-age children. *Sci Data.* 2020 Oct 15;7(1):329.
- Mertz D, Viktorin N, Wolbers M, Laifer G, Leimenstoll B, Fluckiger U, et al. Appropriateness of antibiotic treatment in intravenous drug users, a retrospective analysis. *BMC Infect Dis.* 2008 Apr 3;8:42.
- Mosseler K, Materniak S, Brothers TD, Webster D. Epidemiology, Microbiology, and Clinical Outcomes Among Patients With Intravenous Drug Use-Associated Infective Endocarditis in New Brunswick. *CJC Open.* 2020 Sep 1;2(5):379–85.
- Straw S, Baig MW, Gillott R, Wu J, Witte KK, O'regan DJ, et al. Long-term Outcomes Are Poor in Intravenous Drug Users Following Infective Endocarditis, Even After Surgery. *Clin Infect Dis.* 2020 Jul 27;71(3):564–71.
- Klester E, Klester K, Igor B. Septic pulmonary embolism in intravenous drug users. *Eur Respir J.* 2017;50(suppl 61). Available from: https://erj.ersjournals.com/content/50/suppl_61/PA2353
- Galili Y, Lytle M, Carlan S, Madruga M. Bilateral Pneumothoraces: A Rare Complication of Septic Pulmonary Emboli in Intravenous Drug Abusers. *Am J Case Rep.* 2018 Jul 14;19:829–32.

20. Colville T, Sharma V, Albouaini K. Infective endocarditis in intravenous drug users: a review article. *Postgrad Med J*. 2016 Feb 1;92(1084):105–11.
21. Ji Y, Kujtan L, Kershner D. Acute endocarditis in intravenous drug users: a case report and literature review. *J Community Hosp Intern Med Perspect*. 2012 Apr 30;2(1):10.3402/jchimp.v2i1.11513.
22. Deeks SG, Archin N, Cannon P, Collins S, Jones RB, de Jong MAWP, et al. Research priorities for an HIV cure: International AIDS Society Global Scientific Strategy 2021. *Nat Med*. 2021 Dec;27(12):2085–98.
23. Li J, Wang J, Tian K, Wang Y, Zhang L, Huang H. Epidemiology of hepatitis B, C, D and G viruses and cytokine levels among intravenous drug users. *J Huazhong Univ Sci Technol Med Sci Hua Zhong Ke Ji Xue Xue Bao Yi Xue Ying Wen Ban Huazhong Keji Daxue Xuebao Yixue Yingdewen Ban*. 2006;26(2):221–4.
24. Grassi A, Ballardini G. Hepatitis C in injection drug users: It is time to treat. *World J Gastroenterol*. 2017 May 28;23(20):3569–71.
25. Bruggmann P, Blach S, Deltenre P, Fehr J, Kouyos RD, Lavanchy D, et al. Hepatitis C virus dynamics among intravenous drug users suggest that an annual treatment uptake above 10% would eliminate the disease by 2030. *Swiss Med Wkly*. 2017 Nov 8;(45). Available from: <https://smw.ch/article/doi/smw.2017.14543>