Seroprevalence of hepatitis B, hepatitis C and HIV among male injecting drug users in Afghanistan

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Abstract

Background: Viral hepatitis and HIV infections are common public health concerns among injecting drug users, however, there is limited evidence on their seroprevalence in Afghanistan.

Aim: To determine the seroprevalence of hepatitis B, hepatitis C and HIV among male injecting drug users at Ibn Sina Drug Addiction Treatment Hospital, Kabul, Afghanistan.

Methods: Using a structured questionnaire, we interviewed 397 injecting drug users at Ibn Sina Drug Addiction Treatment Hospital, Kabul, Afghanistan, between November and December 2022. We collected and tested 3–5 ml blood samples from the participants. We analysed the data using Epi Info version 7.2.1 and used binary logistic regression and χ^2 tests to identify potential predictors of blood-borne hepatitis B, hepatitis C and HIV infections.

Results: Of the total participants, seroprevalence of hepatitis B was 3.79%, hepatitis C 2.77% and HIV 0.50%. Syringe reuse (10%), sharing of syringes (18.6%) and history of blood transfusion (20.2%) were common, but there was no statistically significant association between these predictors and infection ($P < 0.05$). However, using shared blades was positively associated with hepatitis B infection.

Conclusion: Although hepatitis B, hepatitis C and HIV seroprevalence were lower in our study than in previous studies, and no significant association was found between the risk factors and these diseases, there is a need to expand harm reduction services beyond needle-syringe programmes to include non-syringe components. The association between shared blade use and hepatitis B infection indicates that harm reduction efforts should also incorporate safe shaving practices.

Citation: Hakim MS, Hashimi MH, Saeed KMI, Naeemi S, Safi F, Sayedzai SA, et al. Seroprevalence of hepatitis B, hepatitis C and HIV among male injecting drug users in Afghanistan. East Mediterr Health J. 2026;32(2):61–68. https://doi.org/10.26719/2026.32.2.61.

Received: 13/01/2025; Accepted: 30/09/2025

Introduction

Hepatitis B virus (HBV), hepatitis C virus (HCV) and HIV are major public health concerns, especially in developing countries (1). Globally, there are > 254 million people with HBV, > 50 million with HCV and > 39.9 million with HIV (*2*,*3*).

Drug addiction is a global problem that affects users' health, leading to disability and premature death (*4*). Recent estimates suggest that 1 in 17 individuals uses drug and there are ~300 million drug users globally (*5*). Injecting drug users (IDUs) have a wide range of complex challenges, including health as well as social, economic and political issues (*6*). Current data suggest that ~13.2 million of the addicts worldwide are IDUs, with male users being 5 times more common than female users (*5*). In addition to life-threatening health issues, including overdose, mental health problems and injection-related diseases (*7*), IDUs are exposed to high-risk behaviour, including sharing needles and high-risk sexual practices (*8*). This puts IDUs at high risk of blood-borne infections (*9*), with HBV, HCV and HIV being particularly important (*10*). Globally, it has been estimated that 15.2% of IDUs live with HIV and 18.5% with HCV (*11*). The unsafe practices around injecting drug use contribute to 23% of new HCV cases worldwide, making them a major driving factor in the ongoing HCV epidemic (*5*).

IDUs are a major problem in low-and-middle income countries because of political instability, funding problems, social and environmental risks and health system coverage (*12*). Afghanistan has been faced with many challenges in recent decades (*13*). The country contributes > 80% of the global production of opium (*14*), and is dealing with several health problems (*15*,*16*), economic difficulties (*17*) and a major increase in unemployment (*18*). Afghanistan has a high level of injecting drug use and high-risk sexual behaviour, with limited access to harm reduction measures and treatment facilities. This increases the risk of blood-borne infection, including HBV, HCV and HIV among IDUs (*19*). A study in Kabul showed 3% prevalence for HIV, 36.6% for HCV and 6.5% for HBV among 464 IDUs; most of whom used shared needles (*20*). Another study among IDUs in Herat, Jalalabad and Mazar-e-Sharif reported a prevalence of 1.8%, 36% and 5.8% for HIV, HCV and HBV, respectively (*21*).

However, the prevalence of HBV, HCV and HIV is lower in Afghanistan than in South Africa (22), Islamic Republic of Iran (23) and Pakistan (24). Hepatitis B is the predominant type of hepatitis in Afghanistan, with prevalence of 1.82% and 7.36 deaths per 100 000 cases (25). The prevalence of HCV is 0.24% with 5.6 deaths per 100 000 cases (26). HIV infection was first reported in Afghanistan in 1989 and has since increased to 11 000 cases nationwide (27).

Although there has been an increase in the number of IDUs in Afghanistan, and a significant burden of blood-borne infections, there are limited current data on the seroprevalence of HBV, HCV and HIV among this population. Therefore, this study aimed to determine the seroprevalence of HBV, HCV and HIV and its associated factors among IDUs in a specialized treatment centre in Kabul, Afghanistan.

Methods

Study design

A cross-sectional study was conducted among IDUs in Ibn Sina Drug Addiction Treatment Hospital, Kabul during November and December 2022. The facility treats drug users from all over the country, but most are from Kabul city. The hospital has an overall capacity of 2500 beds, which are always occupied.

Ibn Sina Drug Addiction Treatment Hospital is currently dedicated only to male drug users for treatment, counselling and follow-up. A sample size of 400 participants was calculated using the Cochrane formula with 95% confidence interval, prevalence 36% (previous studies in Afghanistan), 5% margin of error and adjustment of 10% for nonresponse rate. Participants were aged > 18 years. Three individuals refused to take part in the study, leaving a total of 397 participants.

This study used a structured questionnaire consisting of 4 parts: (1) sociodemographic characteristics of participants, such as age, residence, education, marital status and occupation; (2) history of drug use and risk factors for HBV, HCV and HIV; (3) knowledge of participants about HBV, HCV and HIV; and (4) results of rapid diagnostic tests (RDTs) for each disease. The questionnaire was pre-tested before official data collection and necessary changes were incorporated.

Data collection

Data were collected by 4 trained collectors and a phlebotomist. Data collectors used systematic random sampling to select IDUs from the inpatient (retrospective) and outpatient (prospective) departments using the available register and an interval of 6 patients. The questions were asked in accordance with the literacy level and knowledge differences among the participants, and further explanation was provided in cases of ambiguity. The data collectors explained the study to the participants and assured them of safety and confidentiality before starting the interview. Any missing responses were filled in immediately by the interviewer.

Specimen collection and laboratory procedures

Blood samples of 3–5 ml were taken from participants in compliance with infection prevention and control measures. Samples were stored in tubes, labelled and sent to Central Public Health Laboratories using a triple package system at appropriate temperature in accordance with the standard operating procedures for diagnosis of blood-borne infectious diseases. Rapid diagnostic tests (RDTs) (HEALGEN, Houston, YX, USA) were performed to determine the seroprevalence of HBV, HCV and HIV. RDTs for HCV and HIV detected antibodies, while HBV was assessed by HBV surface (HBs) antigen detection. Positive RDT results for HIV were confirmed by ELISA (performed by HIV Directorate of the Ministry of Public Health), and HBV and HCV positive samples were retested using an RDT from another manufacturer (ACON, Hangzhou, China). The RDTs took an average of 15 minutes, and had specificity of 86% and sensitivity of 76%. The HIV ELISA took 24–48 hours. HIV-positive RDT results were followed up through the National Program for Control of AIDS, Sexually Transmitted Infections, and Hepatitis. There are currently no follow-up procedures or treatment pathways for HBV and HCV in Afghanistan and the data on cases are collected in a routine manner.

Data management and analysis

Questionnaires were checked for any missing or incorrect information. Data were entered into a preconfigured form designed using Epi Info version 7.2.1 software. Descriptive statistics, including frequency assessment and geographical plotting, were utilized. Binary logistic regression and χ^2 tests were used to identify potential predictors of blood-borne HBV, HCV and HIV infections, using an alpha level of 0.05 and confidence level of 95%. Seroprevalence of HBV, HCV and HIV is shown by percentages, and frequency of risk factors, including drug use history, is shown in tables. Data management, including data entry, cleaning and analysis, was conducted using Excel and Epi Info version 7.2.1. The main findings are shown in the figures and tables and STATA/SE version 18 was used for multivariate analysis.

Ethics considerations

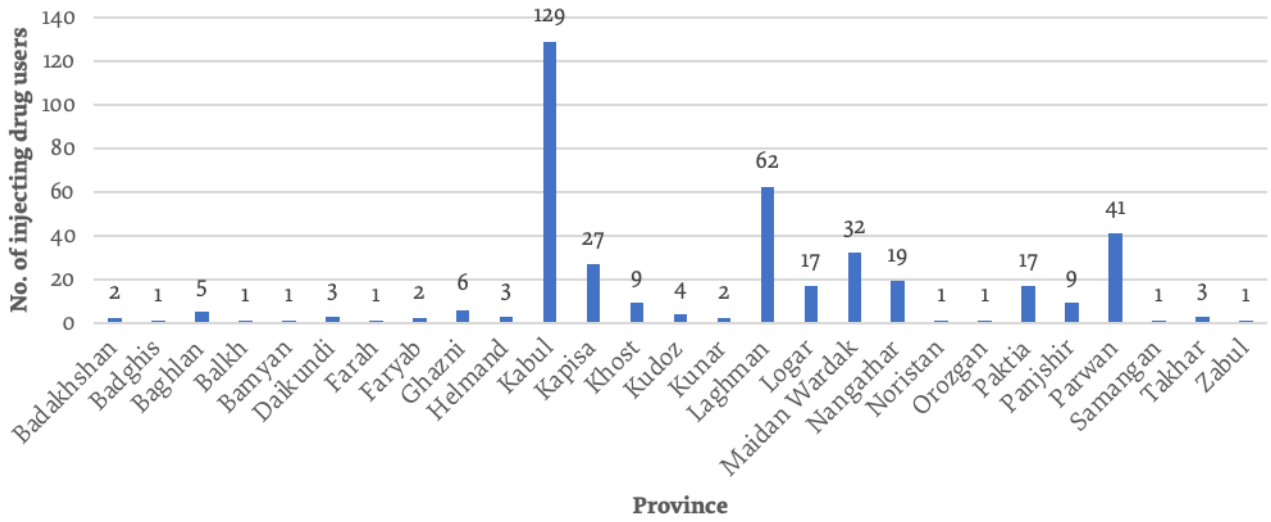
The study was approved by the Institutional Review Board of Afghanistan National Public Health Institute. The IDUs gave their signed consent to the interview and specimen collection process. Due to the cultural and ethical sensitivity of the study, participants were assured of data confidentiality and respect for their rights. Positive results were kept anonymous and only for the purpose of this study.

Results

Participants' sociodemographic characteristics

Among the 397 IDUs, 129 (32.25%) were from Kabul, 62 (15.50%) from Laghman and 41 (10.25%) from Parwan Provinces (Figure 1). Almost two thirds of the IDUs (288, 72.18%) were married and 265 (66.25%) were illiterate

Figure 1 Distribution of study participants by province, 2022



(Table 1). The mean age was 32.7 ± 10.03 years, and 253 (63.41%) were unemployed.

Drug use and risk factors

The average duration of drug use was 8.5 years, with 162 (40.81%) IDUs injecting drugs > 3 times a day. The drug types used are shown in Table 1.

Most IDUs (356, 89.90%) reported using syringes once and disposed of them after injection, 36 (9.09%) used a syringe twice, and 4 (1.01%) used a syringe more than twice (Table 2). Seventy-four IDUs (18.64%) used shared syringes. In addition, 80 (20.15%) had a blood transfusion previously, and 252 (63.48%) reported their wives as their sexual partner. When IDUs were asked about shaving or trimming their head and body hair, 87 (21.97%) reported using blades, 272 (68.69%) went to the barbers, and 36 (9.09%) used scissors. Among all participants, 66 (16.58%) used shared blades for shaving or trimming.

Seroprevalence of HBV, HCV and HIV

Fifteen IDUs (3.79%) tested positive for HBs antigen, 11 (2.77%) for HCV antibodies and 2 (0.50%) for HIV antibodies. This resulted in prevalence of 3.79%, 2.77% and 0.50% for HBV, HCV and HIV, respectively. One patient was positive for HBV and HCV, and another was positive for HCV and HIV. No one had co-infection for all 3 diseases.

Among the 397 IDUs, 226 (56.93%) had knowledge of HBV, 206 (51.89%) had knowledge of HCV and 180 (45.45%) had knowledge of HIV. Different sources of information on HBV, HCV and HIV were reported: 32.50% television, 19% radio, 17.75% friends, 9.50% family members and 3.25% other sources. Binary logistic regression and χ^2 tests were performed to assess the association between the selected predictors and blood-borne HBV, HCV and HIV infection. None of the variables showed a significant association with the outcome ($P < 0.05$) (Table 3). The overall model could not identify predictors for the occurrence of HBV, HCV and HIV.

Table 1 Sociodemographic characteristics and drug use pattern among study participants

Sociodemographic factors	No.	%
Age (years)		
>18–30	209	52.3
>30–45	146	36.5
>45–60	39	9.8
>60	6	1.5
Education		
Illiterate	265	66.3
High school	112	28.0
Bachelor's degree	15	3.8
Above bachelor's degree	8	2.0
Marital status		
Single	108	27.1
Married	288	72.2
Divorced	2	0.5
Others	1	0.3
Occupation		
Employed	146	36.6
Unemployed	253	63.4
Types of drugs used		
Heroine	397	99.5
Shesha	269	67.3
Marijuana (hashish)	208	52.0
Morphine	109	27.3
Opium	57	14.3
Tablet K	42	10.5

Table 2 Risk factors for hepatitis B, hepatitis C and HIV infection

Risk factors	No.	%
Frequency of using one syringe		
Once	356	89.9
Twice	36	9.1
More than twice	4	1.0
Using shared syringes		
Yes	74	18.6
No	323	81.4
Blood transfusion		
Yes	80	20.2
No	317	79.9
Sex partner		
Wife	252	63.5
None	115	29.0
Others	30	7.6
Trimming/shaving hair (head, body parts)		
Blade	87	22.0
Barber	272	68.7
Scissors	36	9.1
Others	1	0.3
Using shared blades for shaving		
Yes	66	16.6
No	332	83.4

Table 3 Factors associated with blood-borne infections among injecting drug users

Variables	OR (95% CI)	P
Education category		
Literate	Ref	
Illiterate	1.78 (0.64–4.96)	0.27
Knowledge of hepatitis B		
Yes	Ref	
No	1.23 (0.42–3.58)	0.699
Knowledge of hepatitis C		
Yes	Ref	
No	0.90 (0.30–2.63)	0.851
Knowledge of HIV		
Yes	Ref	
No	2.75 (0.94–8.08)	0.065
Sharing needle with others		
Yes	1.59 (0.59–4.23)	0.352
No	Ref	
Blood transfusion		
Yes	1.25 (0.44–3.51)	0.663
No	Ref	
Frequency of drug use		
<2 times	Ref	
>2 times	1.30 (0.54–3.15)	0.551

Discussion

This study showed that IDUs in Kabul had been using drugs for an average of 8.5 years, with heroin being the most used substance. While most of them reported using single-use syringes, a notable number engaged in high-risk behaviour such as sharing syringes and blades. The seroprevalence of HBV, HCV and HIV were 3.79%, 2.77% and 0.50%, respectively. Awareness of these infections was moderate, with television serving as the main source of information. Statistical analysis found no significant association between sociodemographic or behavioural variables and infection status, except for shared blade use, which was significantly associated with HBV infection. Importantly, knowledge of HBV, HCV and HIV did not correlate with infection outcomes.

The study population was entirely male, with most participants from Kabul Province. The education level and employment rate were surprisingly low, with over two thirds of the IDUs being illiterate and > 63% unemployed. These factors may have contributed to engagement in high-risk behaviour, as found in other studies (*28*). The mean age of 32.7 years suggested that most IDUs were in their economically productive years, yet they faced high unemployment rates, exacerbating their socioeconomic challenges.

The seroprevalence of HBV (3.79%), HCV (2.77%) and HIV (0.50%) was lower than in other studies, which may be because most IDUs were from Kabul Province, where lower disease prevalence has been reported than in other provinces (*29*). Additionally, the availability of harm reduction programmes in Kabul may have contributed to these lower rates. However, this does not imply that the risk of an HIV epidemic is reduced, as continued risky behaviour can facilitate viral transmission. Co-infection with HBV and HCV was observed in 1 IDU, and co-infection with HCV and HIV was reported in another, indicating the need for integrated screening and treatment programmes.

The average duration of drug use was 8.5 years, with a substantial proportion injecting drugs > 3 times a day. Heroin was the most used drug (99.50%), followed by shesha (67.27%) and marijuana (52%). This highlights the high dependency on opioids; a trend also observed in global studies (*30*). The use of multiple drugs increases the likelihood of risky behaviour, including needle sharing and unsafe injection practices, thereby escalating the risk of infections. Being a female drug user in a conservative country like Afghanistan and seeking treatment adds to stigma. As a result, men are more likely to visit addiction treatment centres and hospitals (*31*). A seroprevalence survey among 196 516 Afghan citizens between 2014 and 2017 showed that significantly fewer women than men tested positive for HBV, HCV and HIV (*32*). A study conducted among 520 female sex workers in Kabul, Jalalabad and Mazar-e-Sharif showed that the prevalence of HIV, HCV and HBV was 0.19%, 1.92% and 6.54%, respectively; again, lower than the rates among male participants in other studies (*33*).

Ibn Sina Drug Addiction Treatment Hospital is a prominent centre for treating drug users in Afghanistan. Most admitted patients are homeless drug users gathered by government authorities from streets and under bridges around the city. However, many drug users remain non-attendees. Various other vulnerable populations who engage in high-risk behaviour for HIV were not included in this study. Therefore, the 0.50% HIV rate may not represent the overall at-risk population. Afghanistan is endemic for HIV, and its prevalence is increasing among IDUs exposed to high-risk factors such as needle and blade sharing, making it likely that the rates will continue to increase (*34*).

It is also important to consider that the low rates of HBV, HCV and HIV reported in this study may be due to the use of a specific RDT kit. Because any exposure to HBV can result in a positive test for antibody to HBV core antigen (*35*), it is possible that more cases would have been detected with additional testing methods. The use of multiple testing methods simultaneously could increase the number of positive cases, as IDUs are exposed to multiple risk factors. Further studies using additional HBV markers, such as anti-HBs and anti-HB core antigens, are needed to more comprehensively explore the correlates of HBV infection among this population, which faces complex exposure pathways from both endemic and parenteral transmission sources.

The IDUs in this study were all outpatients or inpatients of the target hospital, with most of them gathered from different parts of the city through government campaigns. IDUs reported using different types of drugs via inhalation, oral routes and injection, exposing them to multiple risk factors for HBV, HCV and HIV infection. Over 18% reported sharing syringes. Evidence suggests that injecting drug use, needle/syringe sharing and unprotected sex are major risk behaviours for HIV infection among drug users (*36*), which also applies to HBV and HCV.

Among the IDUs, 18.64% reported sharing needles, while 16.58% reported sharing blades for shaving and trimming hair, which was significantly associated with HBV antigen positivity. This finding underscores the need for harm reduction programmes that extend beyond needle and syringe distribution. Additionally, 20% of IDUs reported having undergone blood transfusion previously, but no significant association was detected between blood transfusion history and HBV, HCV or HIV infection. The inconsistency with other studies could be due to participation in harm reduction programmes, which are implemented in Afghanistan, particularly in Kabul, where they are accessible near IDU hotspots. The lack of association between blood transfusion and HBV, HCV and HIV infection was also likely because blood is screened for infection in all transfusion centres in Afghanistan. However, the possibility of receiving injections from nonmedical personnel remains high (*37*). Despite being at high risk, knowledge about HBV, HCV and HIV among the IDUs was suboptimal. While 56.93% of the participants were aware of HBV, and 51.89% knew about HCV, only 45.45% had knowledge of HIV. The primary sources of information were television (32.50%), radio (19%) and peers (17.75%). These findings indicate the need for tailored communication strategies to reach IDUs more effectively. Limited awareness may contribute to continued risky behaviour, underscoring the need for more effective awareness campaigns.

Study limitations

This study had some limitations. The IDUs were exclusively male, reflecting the demography of the treatment centre. As a result, knowledge regarding female IDUs remains limited. The RDT kits used in this study are among the most commonly available in the Afghanistan market. Although their sensitivity and specificity are low, they are recommended by WHO. Testing for surface antigens alone may not have accurately determined the true prevalence of these diseases.

Conclusion

This study found lower seroprevalence for HBV, HCV and HIV among IDUs than previous studies. There was no significant association between risk factors and the target diseases; however, using shared blades was positively associated with HBV. The study highlights the need to expand harm reduction services beyond needle-syringe programmes to include nonsyringe components. The association between shared blade use and HBV infection indicates that harm reduction efforts should also incorporate safe shaving practices. Tailored awareness campaigns are essential to improve knowledge about HBV, HCV and HIV, particularly through high-reach, accessible media, including peer education and the enhancement of existing networking and awareness programmes.

Acknowledgements

We would like to express our gratitude to Global Health Development (Eastern Mediterranean Public Health Network; EMPHNET), and the US Centers for Disease Control for their support of the Field Epidemiology Training Program (FETP) in Afghanistan and their support for this study. We acknowledge the Afghanistan National Public Health Institute for providing the opportunity to conduct this study. We appreciate the support of all the parties involved in the different stages of this study.

Funding: This project was conducted as a part of Afghanistan FETP intermediate cohort III group project and was funded by the EMPHNET.

Conflict of interests: None declared.

Séroprévalence des virus de l'hépatite B et C et du VIH chez les consommateurs de drogues injectables de sexe masculin en Afghanistan

Résumé

Contexte : L'hépatite virale et l'infection à VIH sont des problèmes de santé publique répandus chez les consommateurs de drogues injectables, mais les données sur leur séroprévalence en Afghanistan sont limitées.

Objectif : Déterminer la séroprévalence des virus des hépatites B et C ainsi que du VIH chez les consommateurs de drogues injectables à l'hôpital de traitement des toxicomanies Ibn Sina, à Kaboul (Afghanistan).

Méthodes : À l'aide d'un questionnaire structuré, nous avons interrogé 397 consommateurs de drogues injectables à l'hôpital de traitement des toxicomanies Ibn Sina entre novembre et décembre 2022. Nous avons prélevé et testé trois à cinq millilitres d'échantillons de sang chez les participants. Nous avons analysé les données à l'aide du logiciel Epi Info version 7.2.1 et utilisé la régression logistique binaire ainsi que des tests du khi carré pour identifier les facteurs prédictifs potentiels des hépatites B et C ainsi que des infections à VIH transmises par le sang.

Résultats : Sur l'ensemble des participants, la séroprévalence des virus de l'hépatite B et C et du VIH était de 3,79 %, 2,77 % et 0,50 % respectivement. La réutilisation des seringues (10 %), le partage des seringues (18,6 %) et les antécédents de transfusion sanguine (20,2 %) étaient fréquents, mais il n'y avait pas d'association statistiquement significative entre ces facteurs prédictifs et l'infection (p > 0,05). Cependant, l'utilisation de lames communes était positivement associée à l'infection par le virus de l'hépatite B.

Conclusion : La séroprévalence des virus des hépatites B et C ainsi que du VIH était plus faible dans notre étude que dans les études précédentes, et aucune association significative n'a été observée entre les facteurs de risque et ces infections. Cependant, il est nécessaire d'étendre les services de réduction des risques au-delà des programmes d'échange de seringues pour inclure d'autres éléments que les seringues. Le lien entre l'utilisation partagée des lames et l'infection par le virus de l'hépatite B indique que les efforts de réduction des risques devraient également intégrer des pratiques de rasage sans risque.

الانتشار المصلي لالتهاب الكبد B والتهاب الكبد C وفيروس العوز المناعي البشري بين الذكور متعاطي المخدرات بالحَقْن في أفغانستان

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الخلاصة

الخلفية: التهاب الكبد الفيروسي والعدوى بفيروس العوز المناعي البشري من الشواغل الشائعة في مجال الصحة العامة بين متعاطي المخدرات بالحقن، ومع ذلك، هناك دلائل محدودة على معدل انتشارهما المصلي في أفغانستان.

الأهداف: هدفت هذه الدراسة الى تحديد الانتشار المصلي لالتهاب الكبد B والتهاب الكبد C وفيروس العوز المناعي البشري بين متعاطي المخدرات بالحقن من الذكور في مستشفى ابن سينا لعلاج إدمان المخدرات في كابول، أفغانستان.

طرق البحث: أجرينا مقابلات باستخدام استبيان مُنظَّم مع 397 من متعاطي المخدرات بالحقن في مستشفى ابن سينا لعلاج إدمان المخدرات في كابول، أفغانستان، في الفترة بين نوفمبر / تشرين الثاني و ديسمبر / كانون الأول 2022. وجمعنا 3–5 مليلترات من عينات الدم من المشاركين وفحصناها. وحللنا البيانات بالإصدار 7.2.1 من برنامج Epi Info، واستخدمنا نموذج الانحدار اللوجستي الثنائي واختبار مربع كاي لتحديد العوامل المحتملة المنبئة بالتهاب الكبد B والتهاب الكبد C والعدوى بفيروس العوز المناعي البشري المنقولة عن طريق الدم.

النتائج: بلغ معدل الانتشار المصلي لالتهاب الكبد B من إجمالي المشاركين 3.79%، والتهاب الكبد C ما يصل إلى 2.77%، وفيروس العوز المناعي البشري 0.50%. وكان من الشائع إعادة استعمال المحاقن (10%)، وتبادُل المحاقن (18.6%)، وعمليات نقل الدم السابقة (20.2%)، ولكن لم يكن هناك ارتباط ذو دلالة إحصائية بين هذه العوامل المنبِئة وحدوث العدوى (قيمة الاحتمال > 0.05). غير أن الاستخدام المشترك للشفرات ارتبط إيجابيًّا بعدوى التهاب الكبد B.

الاستنتاجات: بالرغم من أن معدلات الانتشار المصلي لالتهاب الكبد B والتهاب الكبد C وفيروس العوز المناعي البشري كانت في دراستنا أقل مما كانت عليه في دراسات سابقة، ولم يُعثَر على ارتباط يُعتد به بين عوامل الخطر وهذه الأمراض، فإن ثمة حاجة إلى توسيع نطاق خدمات الحد من الضرر بما يتجاوز البرامج الخاصة بالإبر والمحاقن لتشمل المكونات الأخرى غير المحاقن. ويشير الارتباط بين الاستخدام المشترك للشفرات والعدوى بالتهاب الكبد B إلى أن جهود الحد من الضرر ينبغي أن تشمل أيضًا ممارسات الحلاقة المأمونة.

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