

A retrospective study to find the prevalence of HIV, HCV and dual HIV-HCV infection in the prison inmates

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ABSTRACT

Background: People who inject drugs are vastly over-represented, often accounting for 50% of prison inmates, so, the transmission of human immunodeficiency virus (HIV), hepatitis C virus (HCV) and tuberculosis (TB) is a serious problem in many prison systems. The prevalence of HCV infection is so disproportionately high in the correctional population that one in four detainees worldwide is living with HCV and the story is similar for HIV. **Objective:** The objective of the study is to find the prevalence of HIV, HCV and dual HIV-HCV infection in the prison inmates. **Materials and Methods:** A sample of 1569 jail inmates was assessed, after obtaining formal approval from the ethical committee for assessment of the medical record of subjects, to know sero-positivity for HIV and HCV. The data generated is then analysed. **Results:** The results show a very high point prevalence of HIV (10.0%) and HCV (31.6%) in the jail inmates, which is 40 and 30 times higher, respectively, as compared to the national average. A staggering 8.5% of the inmates were found to be positive for both viruses. The sero-prevalence for mono-infection for HCV (23.1%) is found to be significantly higher compared to HIV (1.5%). The infection rate of HCV was found to be three times higher compared to HIV. **Conclusions:** Substantially high prevalence of HIV, HCV and dual HIV-HCV infection exists in the prison inmates. Data suggests high virulence for HCV compared to HIV, as both viruses have common routes of transmission. There is an urgent need to keep a constant check on the intravenous drug usage (IDU) in the prisons that is linked to the common transmission of both these blood-borne viruses.

Keywords: HCV, HIV, HIV-HCV co-infection, prevalence, prisoners

Introduction

It is estimated that more than 10.2 million people, including sentenced and pre-trial detainees, are held in detention centres worldwide.^[1] There are 16 million people who inject drugs worldwide and there are an estimated 165,000 injecting drug

users (IDUs) in India.^[2] People who inject drugs are vastly over-represented, often accounting for 50% of prison inmates,^[3] so, the transmission of human immunodeficiency virus (HIV), hepatitis C virus (HCV) and tuberculosis (TB) is a serious problem in many prison systems.^[4] Global HIV prevalence is up to 50 times higher among the prison population than in the general public.^[5] Due to the enhanced transmissibility of HCV by percutaneous injection, compared with that of HIV, the prevalence of HCV infection can exceed 85% among HIV-infected injection drug users.^[6,7] The prevalence of HCV infection is so disproportionately high in the correctional

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Received: 04-04-2022

Revised: 26-05-2022

Accepted: 30-05-2022

Published: 31-10-2022

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_788_22

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How to cite this article: Singh GP, Lata S, Swu AK, Virk NS, Singh J, Thakkar S. A retrospective study to find the prevalence of HIV, HCV and dual HIV-HCV infection in the prison inmates. J Family Med Prim Care 2022;11:6250-4.

population that one in four detainees worldwide is living with HCV.^[8]

As one-third of these inmates return to their communities every year,^[9] so prison health is somewhere very intimately connected to public health.^[10] Inmates also often may bounce between community and correctional settings without knowing that they are carriers of HCV infection and may engage in virus-spreading behaviour.^[11] So very early, it became clear that correctional facilities would offer an important place to diagnose, treat and prevent hepatitis C viral infection, so that released individuals do not spread the virus to those in the community.^[12-14]

Among patients with chronic HCV infection, approximately one-third progress to cirrhosis, at a median time of less than 20 years.^[15,16] The rate of progression increases with older age, alcoholism, male sex and HIV infection.^[17,18] A meta-analysis found that HCV-HIV coinfecting patients had a three-fold greater risk of progression to cirrhosis or decompensated liver disease than HCV mono-infected patients.^[19] It has been similarly demonstrated that coinfecting patients diagnosed with hepatocellular carcinoma tend to have a more advanced and aggressive liver disease at younger ages, associated with significantly higher mortality rates.^[20] Although antiretroviral therapy (ART) appears to slow the rate of HCV disease progression in HCV-HIV coinfecting patients, by preserving or restoring immune function and by reducing HIV-related immune activation and inflammation,^[21-23] but several studies have demonstrated that the progression rate still continues to exceed that observed in patients without HIV infection.^[24,25] The major contributor to mortality among HIV-HCV coinfecting subjects during the highly active antiretroviral therapy (HAART) era is still a liver disease,^[26-28] as the drug-induced liver injury following the initiation of ART is more common in HCV-HIV coinfecting patients than in those with HIV mono-infection.^[29] So first eradicating HCV infection with ART, may decrease the likelihood of antiretroviral (ARV)-associated liver injury.^[30]

Aims and Objectives

To find the prevalence of HIV, HCV and dual HIV-HCV infection rate in prison inmates.

Materials and Methods

• Study setting:

This study is carried out in the Modern Central Jail at Faridkot, Punjab. It has usually about 1500–1700 inmates, which includes both convicts and under-trials. There are around 80 females. There are significant numbers of inmates who have been convicted for drug-related crimes. On an average, 60–70 people come and go daily to the prison. All the new admissions in the jail are routinely tested for sero-positivity for HIV after getting their due consent.

The study was only carried out after taking an ethical approval from the Institution Review Board of the GGS Medical College and Hospital, Faridkot and the permission from jail authorities.

• Sample selection:

This study included 1609 subjects who had been tested for HIV and their further HIV-positive status was confirmed through sequential testing as per the protocol provided by the National AIDS Control Organisation (NACO). The subjects were also tested for sero-positivity for HCV through an HCV Tri-dot test (Punjab, India) that detects all serotypes of HCV. This retrospective cross-sectional study was carried out in the year 2017 and it includes data generated in the year 2016. The inclusion criteria included all inmates who participated in the mandatory HIV and HCV testing carried out after obtaining informed consent from the inmates in the prison. The exclusion criteria included those subjects who could not be tested for HIV and HCV in the prison.

Out of 1609 subjects, 40 subjects could not be tested for HCV. So effectively, the study sample consisted of a total of 1569 subjects, who were tested for both infections and it included 1483 males and 86 females in total. A proper protocol of maintaining confidentiality and pre- and post-test counselling of inmates was adopted.

Data analysis

Results are expressed as percentages for qualitative variables.

Results

Out of 1569 subjects, 157 subjects were confirmed to be HIV positive after sequential testing and 496 confirmed sero-positive for HCV. The point prevalence for HIV came out to be 10.0%, which is 40 times the current national average. The average HIV

Table 1: Data from HIV and HCV testing of study sample (n=1569)

Parameter	Number	Prevalence
1 Inmates who were tested for HIV and HCV	1569	-----
2 Inmates who tested/confirmed positive for HIV	157	157/1569×100
3 Inmates who tested/confirmed positive for HCV	496	496/1569×100
4 Inmates who had mono-infection with HIV	24	24/1569×100
5 Inmates who had mono-infection with HCV	363	363/1569×100
6 Inmates who had dual diagnosis of HIV-HCV positive status	133	133/1569×100
7 HCV prevalence in HIV positive subgroup	133	133/157×100
8 HIV prevalence in HCV positive subgroup	133	133/496×100

prevalence in India is 0.26% and that of this region (state of Punjab) is 0.19%.^[31]

The prevalence rate for HCV came out to be 31.6%, which is also astonishingly 31 times the current national average. The average prevalence of HCV in India currently is 1%^[32] [Table 1].

The point prevalence for HIV and HCV for female inmates came out to be 0% and 0.25%, respectively. The point prevalence for the dual infection of HIV and HCV came out to be 8.5% as 133 subjects tested positive for both HCV and HIV. More inmates were found to be mono-positive for HCV compared to HIV. Mono-positivity for HCV came out to be 23.1%, whereas for HIV it was a meagre 1.5% only. Data shows that among all HIV-positive subgroups, the prevalence of HCV is 84.7% and among all HCV-positive subgroups, the prevalence of HIV is 26.8%, which is one-third that of HCV. For more details, refer to Charts 1 and 2.

Discussion

The present study finds a very high prevalence of HIV and HCV in jail inmates, compared to the national average and it is a point of big concern. High rates of co-infection for dual HIV and HCV are also a point of concern for both further prognosis and transmission. Both these viruses are linked with IDU and the world over, prisons are places known for high usage of IDUs. As HCV and HIV share common routes for transmission, a disproportionately high mono-positivity for HCV indicates a high virulence rate of HCV compared to HIV. In the wake of the above data, it is a matter of great concern for the health authorities of the state, as there are many examples where prisons acted as a source of a local epidemic for blood-borne diseases like HIV and HCV. Keeping in view of this fact, NACO has stressed on expediting surveillance sites for blood-borne viral infections in prisons.^[33] This study finds that HCV prevalence in HIV inmates is 3.2 times higher than that of HIV prevalence in HCV inmates. As both these diseases have the same mode of

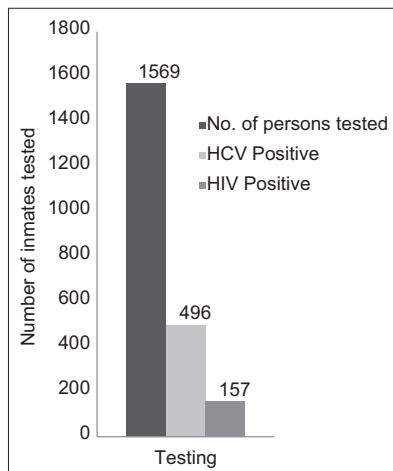


Chart 1: Data shows that the prevalence of HCV is nearly three times that of HIV in the sample population

transmission, it can be safely concluded that the infection rate of HCV is three times more compared to HIV.

The findings of this study are in comparison to other studies that quote the high prevalence of HIV and HCV in prisons.^[4] In a similar study carried out in Brazil, the presence of anti-HCV antibodies was found to be five times higher in prisons than the estimated prevalence (0.53%) for the Brazilian population.^[34] The study confirms that prisons also pose a serious threat to the propagation of HIV and HCV for the public outside, due to the high prevalence and dynamic population in prison. These facts are in agreement with other research findings that have similar results.^[10,11]

The major limitation of this study was that it was limited to one correctional centre only and the data only represented a particular part of the region. To get more exact prevalence, the study should be replicated in more correctional centres.

Conclusions

Substantially high prevalence of HIV, HCV and dual HIV-HCV infection exists in the prison inmates. Data suggests high virulence for HCV compared to HIV, despite the fact both viruses have common routes of transmission. There is an urgent need to keep a constant check on the IDU in the prisons which is linked to the common transmission of both these blood-borne viruses.

Acknowledgements

The authors would like to thank Mr. Sunny Sharma (inmate) and Dr. Rahul Khurana (inmate) for organising peer group activities among HIV-positive inmates and providing valuable support in

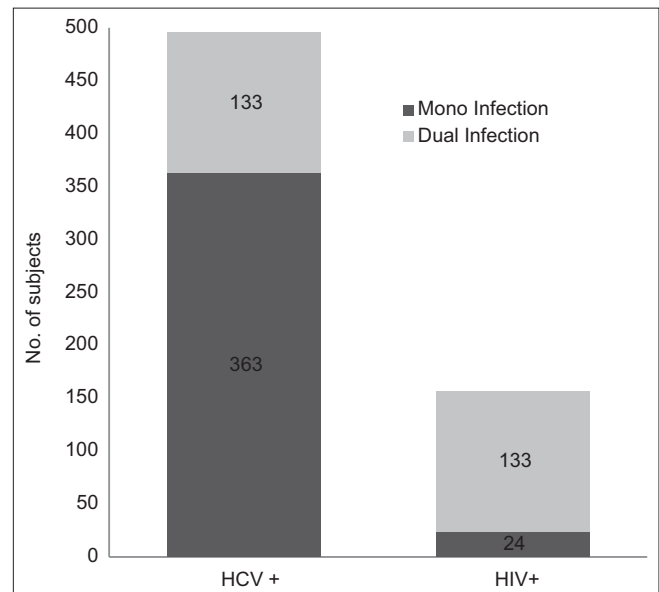


Chart 2: Data shows that the prevalence of HCV among HIV positive inmates is 84.7% and that of HIV among HCV positive subgroup is 26.8%

data collection and data feeding on the computer for carrying out the analysis of this study.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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