Profile of hepatitis B and C virus infection in prisoners in Lubuk Pakam correctional facilities

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Abstract. Prisoners in correctional facilities are predisposed to chronic viral infections because of their high-risk behaviors or unsafe lifestyle. The economic and public health burden of chronic hepatitis B and C and its sequelae need to be addressed, such as by finding the risk factors and therefore reducing the spread of HCV and HBV infection in prisons. This study aimed to see the profile of Hepatitis B and C Virus Infection in prisoners in Lubuk Pakam Correctional Facilities. This cross-sectional study was in Lubuk Pakam Correctional Facilities in 2016. From 1114 prisoners in Lubuk Pakam correctional facility, we randomly examined 120 prisoners for HBV and HCV serology markers. From 120 prisoners, six prisoners were HBV positive, 21 prisoners were HCV positive and one prisoner positive for both HCV and HBV infection. The most common risk factors for prisoners getting HBV infection are tattoos and free sex (36.4% and 36.4%, respectively). The most common risk factors for HCV infection in prisoners are tattoos and free sex (40% and 35%, respectively).

1. Introduction
Inmates in correctional facilities have greater chronic viral infections, substance use disorders, mental illness, and sexually transmitted diseases.[1] The highest prevalence hepatitis C virus (HCV) were in Central Asia (38%) and Australia (35%) and more frequently detected in inmates rather than general population.[2] In prison, the unsafe habits may be predisposed to overcrowding, violence, separation from family and emotional problems.[3] The prevalence of serologic markers of current or past HBV infection among inmates ranges from 13% to 47%. Prevalence is higher among female prisoners (37-47%) than in men (13–32%).[4] An estimate of the incidence of new HCV infections in prisons exceeds 30 per 100 persons per year.[5]

The seroprevalence of hepatitis B and C infections are higher level in inmates due to high-risk factors, including injection drug use (IDU), high-risk sexual activity, and tattoos. IDU is a common risk factor for viral hepatitis in inmates, and variable rates of IDU among inmates have been found to be the most important cause of the marked variability of seroprevalence rates for exposure to hepatitis C virus.[6]
2. Methods

2.1. Patient Selection
This study was a cross-sectional study design with purposive sampling technique, based on risk factor the prisoners had from history taking. There were 120 samples of 1114 prisoners of Lubuk Pakam correctional facility in North Sumatera. This study was in November 2016. The researcher gave explanations and got informed consent from each patient. Inclusion criteria were prisoners both men and women of Lubuk Pakam correction facility and accepted to participate voluntarily in physical examination and laboratory examination. Exclusion criteria were refusal to do a review. The local ethics committee approved this study.

2.2. Definition of Hepatitis B and C
Diagnosis of HBV and HCV viral infection based on the results of positive HBV serologic marker (HBsAg) and HCV serologic marker (Anti HCV).

2.3. Statistical Methods
Data analysis was performed through univariate analyses using the SPSS 22nd version (SPSS Inc., Chicago). We analyzed anamnesis obtained distribution frequency of demographic characteristic and risk factor of hepatitis B and C. Information for risk factor. The results informed the correctional facility to provide further management for the prisoners who needed.

3. Result
From 1114 prisoners in Lubuk Pakam correctional facility, 120 (10.77%) were tested for HCV and HBV serologic marker. Researchers conducted a random sampling technique for hepatitis B (HbsAg) and hepatitis C (Anti-HCV) examination. There were six prisoners that had HBV positive, 21 prisoners had HCV positive and one prisoner had both HBV and HCV positive. The distribution of the demographic characteristic of the selected sample is in table 1, but these are not meant to be generalized. HIV serologic marker also tested in the same 120 prisoners but none of HIV positive. HBV positive subjects, the median age was 35 ± 9.9 years, with the majority were male (80%), the duration of prison term was 12.16 ± 7.36 months, and majority education level was a senior high school (50%). In HCV positive subjects, the median age was 30.81 ± 6.9 years, with the majority were male (95%), the duration of prison term was 14.09 ± 7.11 months and majority education level was senior high school (42.8%).

Table 1. Patients’ demographic characteristics.

| Characteristics          | Hepatitis B (n=6) | Hepatitis C (n=21) |
|--------------------------|------------------|-------------------|
| Sex<sup>a</sup>          |                  |                   |
| Men                      | 5 (83.3)         | 20 (95)           |
| Women                    | 1 (16.7)         | 1 (5)             |
| Age<sup>b</sup>          | 35 ± 9.9         | 30.81 ± 6.9       |
| Duration prison term<sup>b</sup> | 12.16 ± 7.36     | 14.09 ± 7.11     |
| Education level<sup>a</sup> |                  |                   |
| Primary school           | 1 (16.7)         | 4 (19)            |
| Junior High school       | 2 (33)           | 7 (33)            |
| Senior high school       | 3 (50)           | 9 (42.8)          |
| College                  | 0 (0)            | 1 (0.27)          |

<sup>a</sup>categorical data : n (%)  
<sup>b</sup>numeric data, mean ± SD
The prisoners may have multiple risk factors, such as tattoos, free sex, and injecting drugs. In patients with HBV positive, we obtained that the most risk factors were tattoos (36.4%) and free sex (36.4%). The most common risk factor in HCV positive were tattoos (40%) and free sex (35%).

Table 2. The risk factors for Hepatitis B and C.

| Risk Factor | Hepatitis B | Hepatitis C |
|-------------|-------------|-------------|
| IDU*        | 3 (27.2)    | 10 (25)     |
| Tattoos*    | 4 (36.4)    | 16 (40)     |
| Free sex*   | 4 (36.4)    | 14 (35)     |

* categorical data: n (%)  
IDU: Injection Drug User

4. Discussion

In HBV positive subjects, the median age was 35 ± 9.9 years, the with them majority were male (80%), the duration of prison term was 12.16 ± 7.36 months, and majority education level was asenior high school (50%). Meyer (2007) found 87.0% males with a median age of 36 years.[7] Babudieri (2015) found that the number of imprisonments was associated with HIV infection, whereas the duration of incarceration was only associated with anti-HBc.[8] Prasetyo (2013) did not find any association of the characteristics of intravenous drug use and period of current imprisonment with HBV infection [9].

In HCV positive subjects, the median age was 30.81 ± 6.9 years, with the majority were male (95%), the duration of prison term was 14.09 ± 7.11 months, and majority education level was asenior high school (42.8%). Of the inmates, 695 were in the study, 682 (98%) were males, the median age was 43 years. There were 131 (18.8%) foreigners and 564 (81.2%) Italians. HCV seroprevalence was 22.4% (95%CI: 19.4%-25.7%), 60 subjects (38.4%) being HIV co-infected too,[10]

In patients with HBV positive, we obtained that the most risk factors were tattoos (36.4%) and free sex (36.4%). The most common risk factor in HCV positive were tattoos (40%) and free sex (35%). Meyer (2007) found in HCV, 94% was IDU, and the duration was 27.4 months.[7] Prasetyo (2013) found in IDU patients 1.1% were HbsAg[+],[9] Larney (2013) found that one in four detainees overall and two in three detainees with a history of drug injection are anti-HCV positive.[2] Kheirandish (2009) found that increased HCV prevalence was significantly associated with reporting ever sharing injection tools, history of tattooing, and history of prior incarceration.[11] Hennesey (2008) found that in HCV infection, the drug offense found 47% in Chicago, 23% in Detroit, and 40% in San Francisco.[12] Babudieri (2015) found that HIV and HCV seropositivity were related strongly to intravenous drug use (OR: 5.9 for HIV; 10.5 for HCV). The frequency of imprisonment and tattoos were associated, respectively, with HIV and HCV positivity.[8]

We found one prisoner that had both HBV and HCV positive. Prasetyo found that in the prisoner with IDU risk factor, 1.1% was HBV-positive, 50% was HCV positive, and none had HBV and HCV co-infection.[9]

5. Conclusion

From 120 prisoners, six prisoners (5%) were HBV positive, 21 prisoners (17.5%) were HCV positive and one prisoner (0.83%) positive for both HCV and HBV infection. The most common risk factors in HBV and HCV infection in prisoners are tattoos and free sex.

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