POSTER REFERENCE NUMBER: 183

Hepatitis C and B Infection among Prisoners with Active Tuberculosis in Central Brazil

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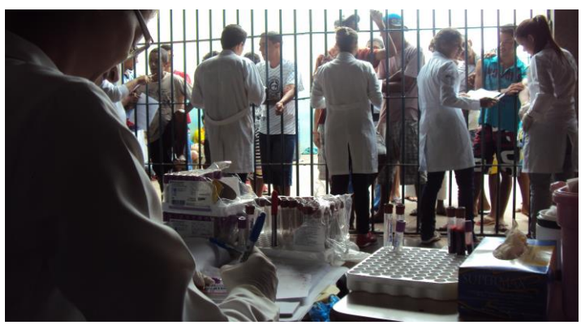
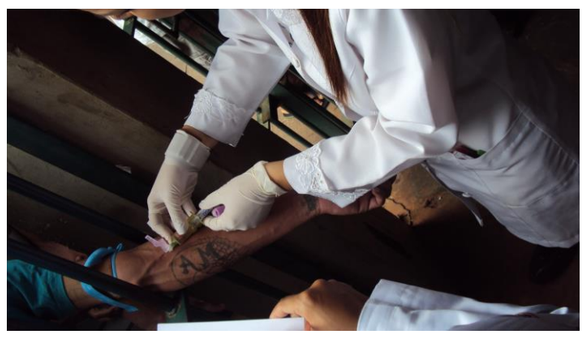
BACKGROUND

Hepatitis C virus (HCV) and hepatites B vírus infections are global public health problem. The prison population is at high risk of contracting infections, such as hepatitis B, C and TB diseases, due to confinement related conditions[1,2]. Although prison infrastructure and conditions vary considerably between different regions, overcrowding, lack of ventilation and poor prevention are common, thus increasing the risks of TB transmission. Therefore, the aim of this cross-sectional study was to investigate the epidemiological and molecular profile of the HBV and HCV infection in prisoners with active tuberculosis recruited from closed penal institutions in Campo Grande, Central Brazil.

METHODS

This cross-sectional survey was conducted among prisoners diagnosed with active tuberculosis (TB) in the capital city of Campo Grande, MS, Central Brazil. From May 2014 to July 2016, male prisoners were recruited at the Presídio de Trànsito de Campo Grande (PTCG), Instituto Penal de Campo Grande (IPCG) and Estabelecimento Penal Jair Ferreira de Carvalho (EPJFC), while female prisoners were recruited at the Estabelecimento Penal Feminino Irma˜ Irma Zorzi (EPFIIZ). The prisoners that have agreed to participate were interviewed and tested for the presence of serological and molecular markers for HBV (n=216) and HCV (n=279) infections using the eletrochemiluminescence electroimmunoassay. All positive or indeterminate samples for anti-HCV were submitted to the detection of HCV RNA by Real Time HCV assay (qPCR). Active TB case was defined as the presence of at least one positive smear microscopy or solid culture for *Mycobacterium tuberculosis*. Participants were interviewed face-to-face to obtain information on sociodemographic characteristics, HBV vaccination and risk factors using a questionnaire. Participation was voluntary, no compensation was provided and written informed consent was obtained. These studies have been approved by the Ethical Committee of the Federal University of Mato Grosso do Sul, Campo Grande, MS, Brazil (CAAE: 32447814.9.0000.0021 and CAAE 27786614.1.0000.002).





RESULTS

The majority prisoners were pulmonary tuberculosis type (97.8%). The overall prevalence of HBV infection (total anti-HBc) was 10.2% (95% 69 CI: 6.2 - 14.2). The overall prevalence of HBV serological markers was 10.2% (22/216, 95%CI 6.2–14.2). Of the 216 inmates with TB, three (1.4%) were positive for HBsAg/anti-HBc. Anti-HBc/anti-HBs was found in 6.5% (14/216) subjects and 2.3% (05/216) were anti- HBc only. Isolated anti-HBs, a marker for the immune response to the HBV vaccine, was presente in 66 (30.5%) inmates. In addition, most (59.3%) of the population studied was susceptible to HBV infection (Table 1). Among 22 inmates who had any HBV serological markers, respectively 22.7% (5/22) and 27.3% (6/22) also presented positivity for anti-HCV and HIV infection. HBV DNA was detected in all 3 HBsAg-positive samples and in 10.5% (2/19) of anti-HBc-positive samples (OBI), resulting in a prevalence of HBV/TB coinfection of 2.3% (5/216). A multivariate analysis 72 of risk factors showed that the history of sharing cutting instruments, length of 73 incarceration time and homosexual sex were associated with HBV infection. The prevalence of HCV exposure was 4.7% (13/279; 95% CI 2.2 – 7.1). Coinfection TB/HCV prevalence among HIV-infected inmates (15.8%) was higher than among HIV-non-infected inmates (3.8%; $p<0.05$). Age over 35 years (adjusted odds ratio (ORadj) 14.50, 95% CI 2.926 - 71.847), have been transferred from prison establishment more than five times in the last incarceration (ORadj 7.40, 95%CI 1.41–38.61) and history of injection drug use (ORadj 21.90, 95%CI 4.30 – 111.42) were independently associated with HCV exposure among prisoners with active TB The presence of HCV RNA was detected in 84.6% (11/13) anti-HCV positive samples. Ten HCV RNA-positive samples were genotyped as genotype 1 (90.9%) and one was classified as genotype 3 (9.1%).

Table 1 - Seroprevalence of hepatitis B virus serological markers among 216 prisoners with active tuberculosis in Central Brazil.

Markers	N	%	95% CI[1]
Infected			
HBsAg/anti-HBc	03	1.4	0.9 – 1.9
Anti-HBc only	05	2.3	1.7 – 2.9
Anti-HBc/anti-HBs	14	6.5	3.3 – 9.8
Total	22	10.2	6.2 – 14.2
Not susceptible, possibly vaccinated	66	30.5	24.4 – 36.7
Not exposed, susceptible	128	59.3	52.7 – 65.8

[1] **Confidence Interval**

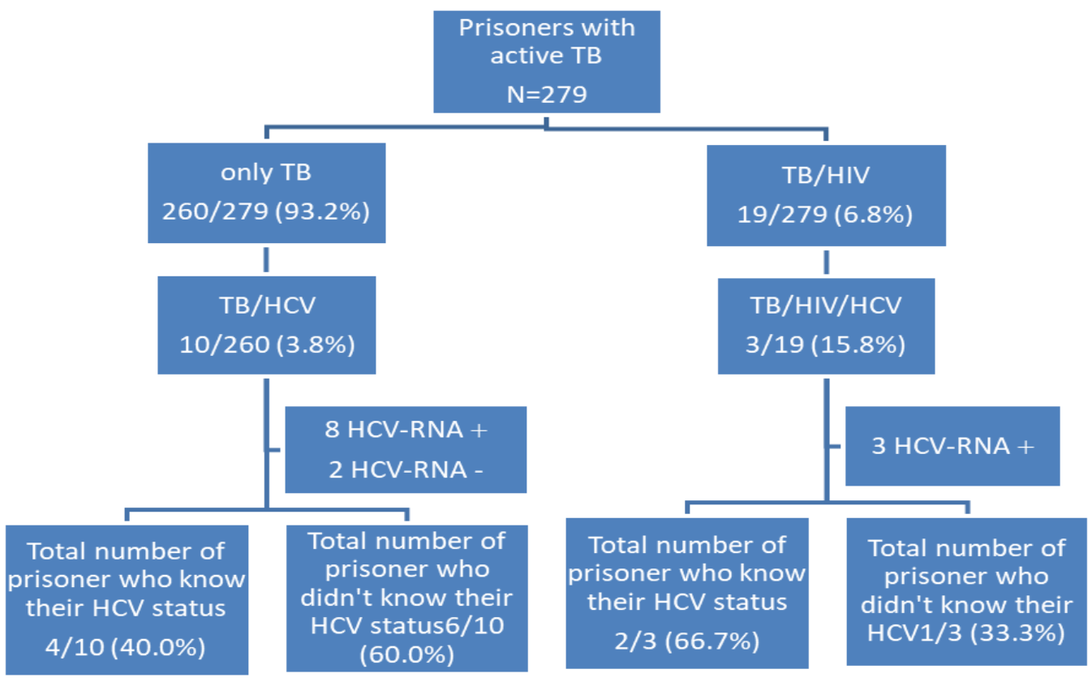


Figure 1 – Enrollment of active TB-infected prisoners in the study.

CONCLUSIONS

Our findings show a high prevalence of HBV infection and risk factors among prisoners with active TB, indicating that HBV and HCV testing should be considered, as well as ongoing surveillance, to better inform treatment decisions. In addition, these results highlight the importance of counselling HCV and HBV testing prisoners with tuberculosis, which can be more effectively and safely treated in order to reduce the side effects of hepatotoxic anti-TB drugs.

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CONFLICTS OF INTEREST

The author(s) declare(s) that there is no conflict of interest regarding the publication of this poster.

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World Hepatitis Summit 2017
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