

# HEPATITIS B AND C INFECTIONS AMONG PRISONERS IN CENTRAL BRAZIL

Marco Antonio Moreira Puga<sup>1</sup>; Mauricio Antonio Pompilio<sup>1</sup>, Larissa Melo Bandeira<sup>1</sup>; Grazielli Rocha de Rezende<sup>1</sup>; Ana Rita Coimbra Motta-Castro<sup>1,2</sup>

<sup>1</sup>Federal University of Mato Grosso do Sul, Campo Grande, MS, Brazil; <sup>2</sup>Oswaldo Cruz Foundation, Mato Grosso do Sul, MS, Brazil.

## BACKGROUND

Infections with hepatitis B virus (HBV) and hepatitis C virus (HCV) are an important public health issue throughout the world. The prison population is considered at high risk of acquiring infectious diseases related to confined conditions due to behavioral factors related to injection drug use and unprotected sexual activity. The aim of this multicenter study was to assess the prevalence, incidence and associated risk factors of HCV and HBV infections among incarcerated populations from twelve Central Brazilian prisons.

## METHODS

The cross-sectional survey was carried out between March 2013 and March 2014. Twelve of the 21 closed high security prisons in the 5 largest cities in the state (Campo Grande, Corumbá, Dourados, Ponta Porã and Três Lagoas) were included (Fig. 1). The total of 3,368 individuals from twelve prisons was randomly recruited between March 2013 and March 2014. Participants were interviewed, and provided blood samples which were tested for serological markers to hepatitis C and B infections. One year after the first investigation, a cohort study was conducted with 1,656 inmates who participated the cross-sectional study. Positive samples were tested for the presence of HCV RNA.



Abbreviations: EPC - Estabelecimento Penal de Corumbá, PTL - Penitenciária de Três Lagoas, EPRB - Estabelecimento Penal Ricardo Brandão, CRAL - Centro de Triagem Anízio Lima, PTCG - Presídio de Trânsito de Campo Grande, IPCG - Instituto Penal de Campo Grande, EPJFC - Estabelecimento Penal Jair Ferreira de Carvalho, PHAC - Penitenciária Harry Amorim Costa, EPFCAJG - Estabelecimento Penal Feminino Carlos Alberto Jonas Giordano, EPFTL - Estabelecimento Penal Feminino de Três Lagoas, EPFPP - Estabelecimento Penal Feminino de Ponta Porã, EPFIIZ - Estabelecimento Penal Feminino Irmã Zorzi.

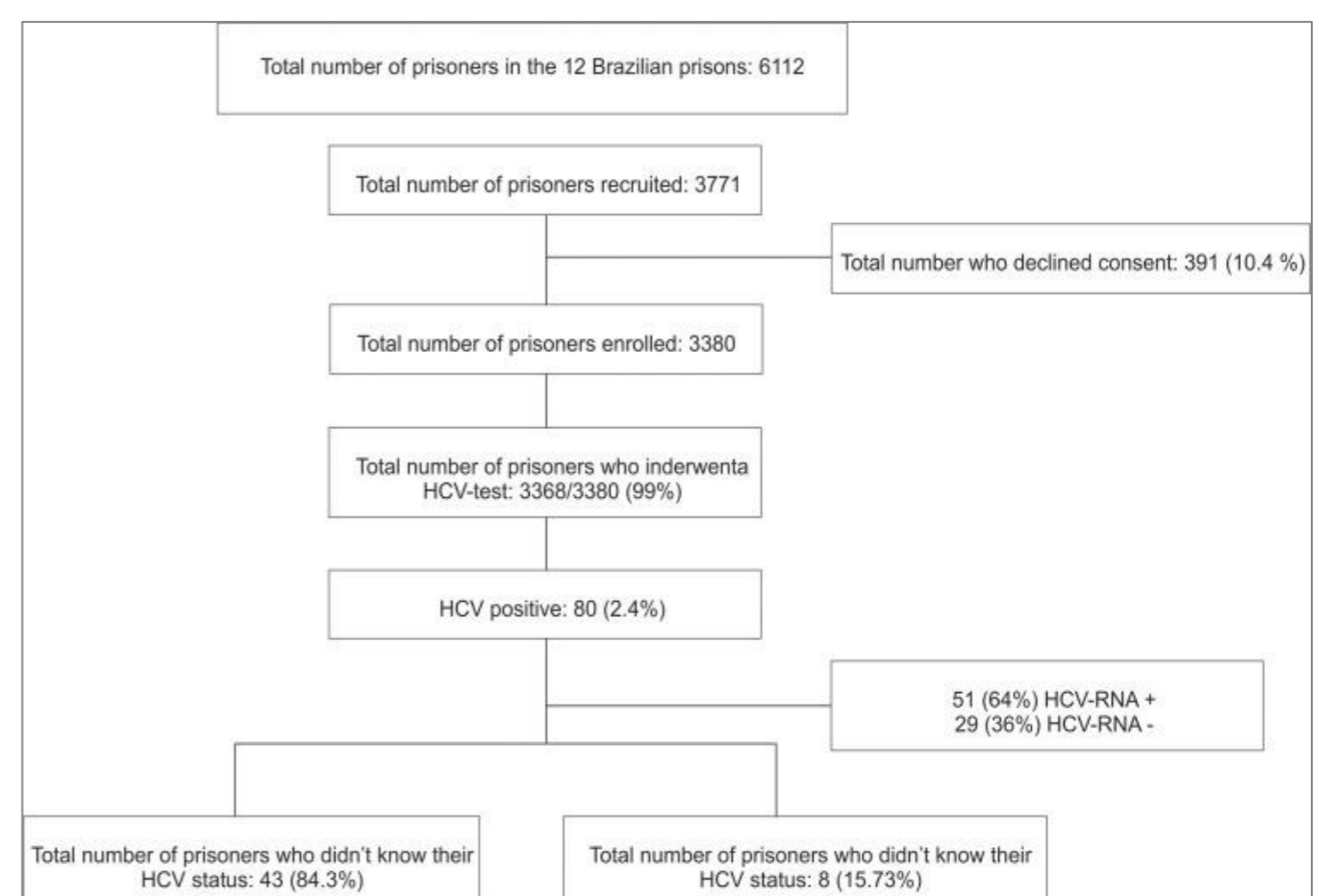
**Figure 1. Geographical location of study prisons, Mato Grosso do Sul, Brazil (Adapted from reference 1).**

## RESULTS

Of the 3,771 prisoners randomly selected to participate, 3,368 (89.3%) agreed to be interviewed and also provided biological samples. Of these, 301 (10.4%) individuals declined to participate the study, and 12 (0.3%) refused blood collection (Fig2)). Out of 3,368, 520 (15.4%) were female (mean age of 31.1 years) and 2,848 (84.6%) were male (mean age of 31.6 years). Out of 3,368 inmates. Significant differences between male and female prisoners were observed for almost all variables, highlighting the importance of analyzing these prisoners separately. The prevalence of HCV exposure found was 2.4% (80/3,368; 95% CI 1.91–2.95), ranging from 0.7% in PTCG (Presídio de Trânsito de Campo Grande) prison to 4.6% in IPCG (Instituto Penal de Campo Grande) ( $p < 0.001$ ), both located in Campo Grande city. HCV prevalence among females (0.6%; 95% CI 0.20–1.68) was lower than among males (2.7%; 95% CI 2.17–3.37;  $p < 0.01$ ). The small sample size of anti-HCV positive cases among female inmates limited our ability to detect statistically significant risk factors. HCV RNA was detected in 51/80 (63.7%) samples. Among men prisoners, multivariate analysis of associated factors showed independent associations between HCV exposure and increasing age, inject drug use, length of incarceration, smoking hashish, sharing needle and syringe and HIV positive. During the cohort study, 07/1,656 new cases of HCV infection were detected, and the incidence rate was 0.4/100 person-year. The overall prevalence of HBV infection was 9.8% (95% CI: 8.8 to 10.8) and 0.5% (95% CI: 0.3 to 0.7) were positive for HBsAg/total anti-HBc. Only 31.3% (95% CI: 29.5 to 32.6) of were positive for isolated anti-HBs, marker of immune response of HBV vaccine, and most of them (59.2%; 95% CI: 57.5 to 60.8) were susceptible to HBV infection.

**Table 1. HBV and HCV serological markers among prisoners in Mato Grosso do Sul, March 2013 and March 2014 (n=3,368).**

| Category         | Serological Markers         | Positive   |                   | CI 95% |
|------------------|-----------------------------|------------|-------------------|--------|
|                  |                             | N          | %                 |        |
| <b>Infection</b> |                             |            |                   |        |
| HCV              | Anti-HCV                    | 2.4        | 1.9 – 2.9         |        |
|                  | HBsAg positive              | 0.5        | 0.3 – 0.7         |        |
| HBV              | Anti-HBc alone              | 1.2        | 0.8 – 1.5         |        |
|                  | Anti-HBc/anti-HBs positive  | 8.1        | 7.2 – 9.0         |        |
|                  | <b>Total</b>                | <b>9.8</b> | <b>8.8 – 10.8</b> |        |
|                  | Anti-HBs alone (vaccinated) | 31.3       | 29.5 – 32.6       |        |
|                  | No marker (susceptible)     | 59.2       | 57.5 – 60.8       |        |



**Figure 2. Flow chart of the recruitment of the study and screening process for HCV.**

## CONCLUSIONS

Once high frequency rates of specific HCV and HBV risk behaviors have been identified inside prisons, effectiveness interventions strategies such as screening assays of blood-borne infections, vaccination against hepatitis B, clinical evaluation and treatment to reduce the spread of HBV and HCV infections are essential.

## REFERENCES

1. Carbone ASS, Paião DSG, Sgarbi RVE, Lemos EF, Cazanti RF, Ota MM, Junior AL, Bampi JVB, Elias VPF, Simionatto S, Motta-Castro ARC, Pompilio MA, Oliveira SMV, Ko AI, Andrews JR, Croda J. Active and latent tuberculosis in Brazilian correctional facilities: a cross-sectional study. BMC infectious Diseases, 15:24, 2015.

## CONFLICTS OF INTEREST

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

### Contact Information

Ana Rita C. Motta-Castro

TEL NO +55 67 9 9264-8326

EMAIL: [arcm.castro@Hotmail.com](mailto:arcm.castro@Hotmail.com); [anacastro@fiocruz.br](mailto:anacastro@fiocruz.br)