

## Hepatitis C and associated risks in prisons: an integrative review

Hepatite C e riscos associados em presídios: uma revisão integrativa

Hepatitis C y riesgos asociados en las cárceles: una revisión integradora

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### ABSTRACT

**Objective:** To assess the current scientific literature on the prevalence of hepatitis C and associated risks in prisons. **Method:** This is an integrative review conducted in the Web of Science, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Literature in the Health Sciences in Latin America and the Caribbean (LILACS in Portuguese) databases, including articles published between 2009 and 2014. Based on the inclusion and exclusion criteria, we selected 16 articles. **Results:** Descriptive (37.5%) and transverse (50%) articles predominated. All of them had level IV of scientific evidence. The prevalence of Hepatitis C was varied and the main risk factors associated with positive results for hepatitis C were injecting drug use, tattooing and age. **Conclusion:** Being a long-haul asymptomatic disease, hepatitis C is revealed as a major problem in the prison system, requiring more attention in order to produce knowledge to guide the adoption of effective measures for control and prevention.

**Descriptors:** Hepatitis C; Prevalence; Prisons; Risk factors.

### RESUMO

**Objetivo:** Conhecer a produção científica atual sobre a prevalência de hepatite C e riscos associados nos presídios. **Métodos:** Trata-se de uma revisão integrativa realizada nas bases de dados Web of Science, Cumulative Index of Nursing and Allied Health (CINAHL) e Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), incluindo estudos nacionais e internacionais publicados entre 2009 a 2014. A partir dos critérios de inclusão e exclusão, foram selecionados 16 artigos. **Resultados:** Predominaram os artigos descritivos (37,5%), transversais (50%). Todos apresentaram nível IV de evidência científica. A prevalência de hepatite C foi variada, e os principais fatores de risco associados à positividade para hepatite C foram o uso de drogas injetáveis, presença de tatuagem, idade. **Conclusão:** Por ser uma doença de longo curso assintomático, a hepatite C apresenta-se como um problema relevante no sistema prisional, exigindo mais atenção no sentido de produzir conhecimentos, que orientem a adoção de medidas efetivas de controle e prevenção.

**Descritores:** Hepatite C, Prevalência, Prisões, Fatores de risco.

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## RESUMEN

**Objetivo:** Evaluar la literatura científica actual sobre la prevalencia de la hepatitis C y los riesgos asociados en las cárceles y publicado en la literatura científica. **Métodos:** Se trata de una revisión integradora realizada en la base de datos Web of Science, CINAHL y Lilacs, incluyendo artículos publicados entre 2009 y 2014. Sobre la base de los criterios de inclusión y exclusión, se seleccionaron 16 artículos. **Resultados:** Artículos predominantes descriptivos (37,5%), transversales (50%). Todos tenían niveles IV de evidencia científica. La prevalencia de la hepatitis C se varió y los principales factores de riesgo asociados fueron consumo de drogas intravenosas, los tatuajes, la edad. **Conclusión:** Al ser una enfermedad asintomática de largo recorrido, la hepatitis C se revela como un problema en el sistema penitenciario, lo que requiere más atención con el fin de producir conocimiento para guiar la adopción de medidas eficaces de control y prevención.

**Descriptores:** Hepatitis C, Prevalencia, Prisiones, Factores de riesgo.

## INTRODUCTION

Hepatitis C has been recognized as one of the leading causes of chronic liver disease worldwide. The complexity and uncertainty related to the geographical distribution of hepatitis C infection, determination of associated risk factors, and evaluation of co-factors that accelerate its progression underscore the difficulties encountered for the prevention and control of HCV.

Hepatitis C represents one of the greatest problems for the world public health due to its severity and high rate of chronicity. It can progress to chronic liver disease, cirrhosis and even hepatocarcinoma, characterizing itself as the major cause of death among all types of hepatitis.<sup>1</sup> An estimated 170 million people (3% of the world's population) are infected and more than 350,000 people die each year from liver diseases related to hepatitis C.<sup>2-3</sup>

It is an inflammation of the liver, caused by the HCV virus, which belongs to the family Flaviviridae, genus Hepacavirus. Its genome consists of a single strand of RNA with about 9600 nucleotides. There are 6 HCV genotypes (from 1 to 6) and many subtypes (a, b, c, etc.) and approximately 100 different chains, based on the heterogeneity of virus genome sequences. The frequency of different genotypes varies from country to country. Genotypes 1, 2 and 3 have worldwide distribution, but their relative prevalence varies from one geographical area to another.<sup>4</sup>

The hepatitis C virus can be transmitted by direct, percutaneous, or contaminated blood. Some populations at risk, such as drug users, persons undergoing hemodialysis, transplanted patients, and incarcerated populations present higher prevalence when compared to the general population, due to a higher exposure to the risk factors related to Hepatitis C.<sup>5</sup>

The major risk factors for hepatitis C are blood transfusion and blood components from unproven donors to anti-HCV, organ transplants from infected donors, injecting drug use, injectable therapies with contaminated (or unsafe) equipment, hemodialysis; occupational exposure to blood, perinatal transmission, and sexual transmission. The recognition of the prevalence pattern of hepatitis C in the different regions may allow a greater effectiveness of

measures for the detection and control of HCV infection.<sup>6</sup> Studies justify the different vulnerabilities to the disease in the different segments of the population.

The prison population is at high risk of contracting infections that are related to conditions of confinement, including viral hepatitis. The impact of HCV infection is not limited only to prison populations, which are often neglected and require specific approaches to the epidemiological profile. Populations deprived of liberty are characterized by marginalization and use of drugs, particularly illicit drugs. These characteristics, coupled with precarious conditions of confinement, including overcrowding, result in a high prevalence of infectious and contagious diseases such as hepatitis C.<sup>2</sup>

Incarcerated individuals are particularly affected since they are at greater risk of being infected due to the use of tattooing, piercing and injecting drug use. In addition, low levels of schooling, lack of knowledge about hepatitis C, large numbers and long periods of imprisonment are factors associated with increased occurrence of infection.<sup>7</sup>

In order to contribute to this discussion, the present study had as objective to know the current scientific production on the prevalence of hepatitis C and associated risks in the national and international prisons, through an integrative review of the literature.

## METHOD

It is an integrative review of the literature, carried out according to the six operational steps: problem identification; guiding question; establishment of inclusion and exclusion criteria; collection of data on scientific bases; selection of articles; analysis and interpretation of results. This method allows the synthesis of multiple published studies and allows general conclusions regarding a particular area of research.<sup>8</sup>

To guide the integrative review, the following question was asked: what are the scientific outputs on the prevalence of hepatitis C and associated factors in prisons?

The bibliographic survey was carried out in three databases: Web of Science, CINAHL (Cumulative Index to Nursing and Allied Health Literature) and LILACS (Latin American and Caribbean Literature on Health Science), in the months of August to November 2014. For the survey of the articles, the descriptors used were: prevalence, hepatitis C and prisons. The cross-referencing of the descriptors in the mentioned bases was performed via the boolean operator AND.

The criteria used for the selection of the sample were: articles published in Portuguese, English and Spanish, from 2009 to 2014, with complete texts available, free of charge in the aforementioned databases, original articles and dealing with the prevalence of hepatitis C and risks in prisons. Articles published in other languages, repeated in the databases and/or that did not address the proposed theme and review studies were excluded.

In the Web of Science database using the descriptors prevalence, hepatitis C and prisons, 117 articles were found

and, after application of the inclusion criteria, 12 were selected. In the CINAHL database, using the same descriptors, 18 articles were found and 4 were selected. After in-depth reading, only two met the inclusion criteria, but one was repeated at the other base. In the end, there was only one article for sample composition. In LILACS, using the same descriptors and without any type of refining, seven studies were found and three were selected for the study. The final sample consisted, therefore, of 16 articles.

After the electronic search procedure in the mentioned databases, the publications were pre-selected based on the reading of the title and abstract. Subsequently, the articles were selected in full. For the data collection of the articles that were included, an instrument was elaborated, based on the analysis dimensions suggested by Broome<sup>9</sup>, which includes the following items: authorship, year of publication, title, type of study, objectives, sample, data treatment, results, conclusions and level of evidence.

The selected studies were classified at the level IV of evidence according to Stetler et al.<sup>10</sup> This level includes non-experimental studies: descriptive, correlational and comparative research, qualitative research and case studies. The articles that composed the final sample of this integrative review were typed in the instrument elaborated, analyzed through descriptive statistics and presented as a table.

## RESULTS AND DISCUSSION

Table 1 summarizes the information provided by the articles that were included in the literature review.

**Table 1** - Distribution of articles on hepatitis C and associated risks in prisons according to author/database/year of publication, sample/ place of study, objectives, type of study/level of evidence and main findings.

| Author/<br>Database/Year<br>of Publication  | Place of<br>study                | Objetives  | Type of Study / Sample /Level of Evidence and main findings   |
|---|----------------------------------|--|---|
| Miller ER, Bi P,<br>Ryan P. / Web of<br>science/ 2009   | 662 / South<br>Australia         | To determine<br>seroprevalence<br>of antibodies and<br>seroconversion to<br>hepatitis C virus (HCV)<br>and associated risk<br>factors in incarcerated<br>newborns.   | Descriptive / IV - (n=662)<br>HCV seroprevalence was estimated at 42%. The significant risk<br>factor was drug use. High seroprevalence, especially in women,<br>indigenous people and drug users. Increased frequency of drug<br>use among those already infected with HCV poses a significant<br>threat to other prisoners and prison staff.  |
| Viitanen P,<br>Vartiainen H,<br>Aarnio J, von<br>Gruenewaldt<br>V, Hakamäki<br>S, Lintonen T,<br>et al. / Web of<br>science/ 2011 | Finland                          | To study the prevalence<br>of hepatitis and HIV<br>infections and risk factors<br>among prisoners in<br>Finland  | Descriptive / IV - (n=388)<br>Among women, HCV was only associated with IDU and syringe/<br>needle sharing. Among men there was also association with the<br>presence of tattoos, cumulative years in prison and age. Young<br>female had a high prevalence of HCV. The study showed that risk<br>factors are differentiated by sex.  |
| Teutsch S,<br>Luciani F,<br>Scheuer N,<br>McCredie L,<br>Hosseiny P,<br>Rawlinson W,<br>et al. / Web of<br>science/ 2010          | New South<br>Wales,<br>Australia | To determine the HCV<br>incidence among<br>injecting drug users<br>and conduct a detailed<br>examination of the<br>demographic and<br>behavioral risk factors<br>associated with HCV<br>transmission.  | Prospective cohort study /IV - (n=488)<br>There were 94 cases of HCV (incidence of 31.6 per 100 persons-<br>year). Independent associations between incident infection and<br>previous arrest, tattooing, and also with methadone maintenance<br>treatment (MMT) were observed. High rates of re-infection by<br>HCV were found in this study reflecting the substantive risk<br>related to behavior. |
| Brandolini M,<br>Novati S, Silvestri<br>A, Tinelli C,<br>Patruno SFA,<br>Ranieri R. et al. /<br>Web of science/<br>2013           | Milan, Italy                     | To assess the prevalence<br>of HCV infection among<br>prisoners and their<br>correlated epidemiology<br>and to test the feasibility<br>of a screening program<br>for HCV infection in<br>an Italian prison and<br>to evaluate treatment<br>outcomes. | Cross-sectional study / IV - (n=695)<br>HCV seroprevalence was 22.4%. This study indicates that the<br>proportion of patients in a prison setting receiving diagnosis and<br>treatment for HCV infection remained low. The weight of HCV<br>infection among HIV positive patients is troubling, as they often<br>cannot be treated due to severe immunosuppression and share<br>the worst prognosis.  |
| Taylor A, Munro<br>A, Allen E,<br>Dunleavy K,<br>Cameron S, Miller<br>L. et al. / Web of<br>science/ 2013                         | Scotland                         | To estimate the incidence<br>of hepatitis C virus (HCV)<br>and risk among Scottish<br>prisoners.   | Cross-sectional study / IV - (n= 5.076)<br>The overall prevalence of antibodies to HCV was 19% (933 out of<br>4904). The low incidence of HCV infections in Scottish prisons<br>is due to the low occurrence of injecting drug use in prison and<br>high coverage of opioid substitution treatment.   |

| Author/<br>Database/Year<br>of Publication  | Place of<br>study   | Objetives   | Type of Study / Sample /Level of Evidence and main findings   |
|---|---|---|---|
| Luciani F,<br>Bretaña NA,<br>Teutsch S, Amin<br>J, Topp L, Dore<br>GJ, et al./Web<br>of science/ 2014                       | New South<br>Wales,<br>Australia                              | To examine the incidence<br>of HCV infection and<br>associated risk behaviors<br>among prospectively<br>followed individuals.   | Prospective cohort study / IV - (n=210)<br>Almost half of the cohort reported injecting drug use during<br>follow-up (103 subjects, 49.1%) and 65 (31%) also reported<br>injecting sharing. The estimated incidence was 14.08 per 100.<br>Three subjects were RNA-positive and negative for antibodies<br>at the time, indicating early infection, which provided a second<br>estimate of incidence of 9.4%.  |
| Hoya PSde la,<br>Marco A, Garcia-<br>Guerrero J. /<br>Web of science/<br>2011   | Spain   | To determine the<br>prevalence of factors<br>associated with hepatitis<br>C virus (HCV) and<br>B (HBV) in Spanish<br>prisoners.   | Cross-sectional study / IV - (n= 378)<br>The prevalence of HCV infection was 22.7% (n = 84) and 40.5%<br>of patients with HCV were co-infected with HIV, 0.3% with HBV,<br>and 1.5% with triple-virus co-infection (HBV + HCV + HIV). The<br>HCV population had a history of injecting drug use (IDU, 23.2%)<br>in prison <5 years (71.2%).   |
| Kirwa P, Evans B,<br>Brant L/ Web of<br>science/ 2011   | England   | To describe the<br>characteristics of<br>prisoners tested for anti-<br>HCV and associated risk<br>factors, trends over time.  | Descriptive / IV - (n=10.723)<br>In general, 24.2% prisoners tested positive for anti-HCV<br>antibodies. Injection drug use was the most frequently reported<br>risk exposure (180/186, 96.8%); Of these, 31 (of 137, 22.6%)<br>prisoners were reported to be current IDUs and 106 (77.4%)<br>ex-IDUs.  |
| Burek V, Horvat<br>J, Butorac K,<br>Mikulic R./ Web<br>of science/ 2010   | The survey<br>was<br>conducted in<br>20 prisons in<br>Croatia | To determine the<br>structure of the<br>prison population, the<br>prevalence of HBV,<br>HCV, HIV markers,<br>co-infections with HBV,<br>HCV and HIV and acute<br>by HBV, HCV and HIV<br>infection.                    | Descriptive / IV - (n=3.348)<br>In total, 25.9% of prisoners were positive for some markers for<br>viral hepatitis. The prevalence of HCV was 8.3%. HCV infection<br>in IDUs was 52.0% and 4.9% in the highly promiscuous group.<br>HBV/HCV co-infection was recorded in 34.9% of HBV-positive<br>prisoners (203/582). Acute HCV infection was detected in<br>1.2%. It appears that individuals with psychiatric disorders and<br>personality disorders could be an additional risk population for<br>viral infections. |
| Barros LAS,<br>Pessoni GC, Teles<br>SA, Souza SMB<br>de, Matos MA<br>de, Martins RMB,<br>et al./ Web of<br>science/<br>2013 | Goiás, Brazil   | To investigate the<br>prevalence and risk<br>factors associated with<br>infection by HBV and<br>HCV and to identify<br>genotypes of these<br>viruses circulating in<br>female prisoners of<br>Goiás, Brazil.          | Cross-sectional study / IV (n= 148)<br>Nine arresters were anti-HCV positive by ELISA and were<br>confirmed by immunoblot. Five of the nine anti-HCV positive<br>samples were also RNA-HCV positive. These samples were from<br>genotype 1, subtypes 1a (n = 3) and 1b (n = 1), and genotype 3,<br>subtype 3 (n = 1). Thus, the circulating genotypes in prisoners<br>of Goiás reflect the diversity of this virus. The association of age<br>with HCV was evident among women > 40 years.                              |
| Santos BFO,<br>Santana NO,<br>Franca AVC./<br>Web of science/<br>2011   | Sergipe, Brazil   | To determine the<br>seroprevalence of<br>hepatitis C virus (HCV)<br>and its genotypes<br>and to identify factors<br>associated with HCV<br>infection.   | Cross-sectional study / IV - (n= 422)<br>The seroprevalence for HCV was 3.1%. Of the 13 subjects with<br>anti-HCV positive, 11 had confirmed viremia by PCR. Of these,<br>90.9% had genotype 1. A total of 43 (10.2%) were injecting drug<br>users, and the seroprevalence of HCV in this subgroup was 20.6%.<br>There was an association between positive HCV and injecting<br>drug use. Age above 30 years, history of syphilis and history of<br>home contact with positive HCV.                                     |
| Falquetto TC,<br>Endringer DC,<br>Andrade TU,<br>Lenz D. / Web of<br>science/ 2013  | Espirito<br>Santo, Brazil                                     | To compare the<br>prevalence of hepatitis<br>C, genotypes, and risk<br>factors among prisoners<br>and non-prisoners in the<br>city of Colatina, Espírito<br>Santo, Brazil.  | Cross-sectional study / IV (n= 2.230)<br>In the prison population, the prevalence of positive HCV<br>RNA was 0.8% (6/730), and for anti-HCV it was 1.0% (7/730).<br>Diagnosis of hepatitis was strongly associated with males<br>(77.7%), monthly income less than three minimum wages<br>(100.0%) and low educational level (77.8%, with four years of<br>schooling or less).  |
| Larney S,<br>Mahowald<br>MK, Scharff N,<br>Flanigan TP,<br>Beckwith CG,<br>Zaller ND. /<br>CINAHL/ 2014                     | Pennsylvania,<br>USA  | To describe the hepatitis<br>C virus (anti-HCV)<br>antibody positivity in<br>a Pennsylvania state<br>prison system and to<br>retrospectively assess<br>case detection in the<br>population born between<br>1945-1965. | Descriptive / IV - (n= 101.727)<br>Prevalence of anti-HCV among 101727 adults in prison was 18.1%.<br>Prevalence was almost twice as high among women (31.3%)<br>compared to men (16.8%).   |



| Author/<br>Database/Year<br>of Publication   | Place of<br>study                                     | Objetives   | Type of Study / Sample /Level of Evidence and main findings   |
|--|---|---|---|
| Pompilio MA,<br>Pontes ERJC,<br>Castro ARCM,<br>Andrade SMO,<br>Stief ACF,<br>Martins RMB. et<br>al. / LILACS/ 2011        | Mato Grosso<br>do Sul, Brazil.                        | Estimate the prevalence<br>of HCV, as well as identify<br>factors associated<br>with infection among<br>prisoners.  | Cross-sectional study / IV - (n= 686)<br>The seroprevalence of HCV infection was 4.8%. In addition,<br>the prevalence was higher in men, injecting drug users,<br>tattooed people, those over 50 years of age, individuals who<br>were arrested multiple times, people with a prior history of<br>sexually transmitted disease (STD), people who received blood<br>transfusions or those with HIV/AIDS.   |
| Coelho HC,<br>Oliveira SAN<br>de, Miguel JC,<br>Oliveira MLA,<br>Figueiredo JFC,<br>Perdoná GC,<br>et al./ LILACS/<br>2009 | Ribeirão<br>Preto, São<br>Paulo, Brazil               | To estimate the<br>prevalence of HCV<br>infection and to evaluate<br>risk factors for this<br>exposure among male<br>prisoners in Ribeirão<br>Preto.  | Cross-sectional study / IV - (n= 333)<br>The prevalence of HCV infection among prisoners was 8.7%.<br>With predominance among individuals over 30 years of age. The<br>variables that were independently associated with HCV infection<br>were: age > 30 years, tattooing, previous history of hepatitis, use<br>of drugs without sharing syringes, and use of syringe-sharing<br>drugs. The results of this study and other studies conducted<br>in recent years indicate that the prevalence of HCV among<br>prisoners in Brazil appears to be declining. |
| Rosa F, Carneiro<br>M, Duro LN,<br>Valim ARM,<br>Reuter CP,<br>Burgos MS, et al.<br>/ LILACS/ 2012                         | Santa Cruz<br>do Sul, Rio<br>Grande do<br>Sul, Brazil | To estimate the<br>prevalence of HCV by<br>means of a rapid test in<br>a prison group from the<br>interior of Rio Grande do<br>Sul, as well as to identify<br>the epidemiological<br>characteristics of the<br>HCV infection. | Descriptive / IV - ( n= 195)<br>A total of 9.7% was HPV reagent. In this analysis, the variable<br>that proved to be a predictor for HCV infection was the use of<br>injectable drugs.  |

Source: Web of Science, CINAHL, LILACS Databases.

Of the 16 articles included in the review, the number of participants involved in the studies varied from 148 to 101727. Through the analysis, it was verified that the majority were from the Web of Science database (75%) and that five of them addressed aspects studied in Brazil (31.2%).

According to Table 1, most of the studies selected were descriptive (37.5%) or transverse (50%), all of them presented level IV of scientific evidence. It can also be observed that the prevalence of Hepatitis C was widely varied in several studies and that the main risk factors associated with positive results for hepatitis C were the presence of tattoos and injecting drug users.

Considering the articles analyzed, there was a significant variation related to the prevalence of Hepatitis C in prisons. The lowest prevalence was found in the study conducted in the city of Colatina, Espírito Santo, among all study participants, the prevalence of HCV was 0.4% (09/2,330), and positive RNA-HCV was 0.3% (08/2,330), with the highest frequencies observed for genotypes 1 (87.5%) and 3 (12.5%). In the prison population, the prevalence of positive HCV-RNA was 0.8% (6/730), and for anti-HCV was 1.0% (7/730). In the non-incarcerated population, the prevalence of HCV-RNA and anti-HCV was 0.1% (2/1600).<sup>11</sup> However, the study conducted in Finland with 88 women and 300 men showed a high prevalence of antibodies against HCV, 52% in the groups. Among females, 71% and males, 43.9%.<sup>12</sup>

The incidence of HCV in the Brazilian population is approximately 1.5%. A study in São Paulo found a prevalence of 16.2% for hepatitis C in woman prisoners, to identify aspects associated with transmission within the prisons.<sup>13</sup> The justification for the positive serological

markers of hepatitis C among the victims is probably due to the sexual risk behavior, tattoos, piercings and previous history of intravenous drug use, which are frequent in this population.<sup>2</sup>

HCV is a virus that can be transmitted by direct, percutaneous, or contaminated blood. In this perspective, injecting drug users (IDUs) are the main interest group for the prevention of their transmission within prisons, since most of these users have already been arrested at some point in their lives. Similar data was found between researchers<sup>14</sup> in which more than half and up to 90% of drug users have ever had an episode of incarceration.

The increased risk of positive HCV results in IDU-related prisons was identified in a randomized clinical trial of 1,325 in-jail drug users conducted in Australia. The study found that the majority were males (77.0%), with an average time since the onset of injecting drug use of 16 years. The vast majority (86.7%) had been arrested previously, and the use of drugs in prison was reported by 285 participants (39.2%). The prevalence of HCV among the individuals tested was 47.4%.<sup>15</sup> Regarding the association of Hepatitis C with the use of injecting drugs in the incarcerated population, this finding was in agreement with another investigation in which the prevalence of HCV was 80%.<sup>16</sup>

The study carried out at the philanthropic, private and public drug treatment centers of Goiânia (GO) and Campo Grande (MS), with a sample of 691 users, of which 102 were IDUs and 589 non-injecting drug users (NIDU). Prevalence of HCV infection was of 6.9% and injecting drug use was the main risk factor for this infection. IDUs had a higher chance of HCV infection when compared to NIDU. In addition, the

prevalence of this infection was almost 12 times higher in the first group than in the second (31.4% versus 2.7%). This fact characterizes injecting drug users as important carriers and potential disseminators of HCV.<sup>17</sup>

Other risk factors such as the presence of tattoos, age, blood transfusion and risky sexual practices were identified in some studies.<sup>7,12,8</sup> In a study carried out in Mato Grosso do Sul prisons, with 443 men and 243 women, the seroprevalence of HCV infection was 4.8%, with a higher prevalence among men, injecting drug users, tattooed people, those with more than 50 year-old individuals who were arrested several times, people with previous history of sexually transmitted disease (STD), people who received blood transfusions or those with HIV/AIDS.<sup>7</sup>

HCV infection is primarily acquired parenterally through transfusion of infected blood, rupture of the skin or mucosal continuity, through infected medical equipment, injecting drug use, hemodialysis, or transplanted organs.<sup>6</sup> It is emphasized that intrauterine transmission is uncommon. In relation to age, the study that identified the prevalence of HCV in adult users of the public health service in a municipality of the Paraná<sup>1</sup> revealed that the highest prevalence of positive cases is found in the intermediate age groups, mainly between the ages of 30 and 49 years.

Among non-parenteral forms of hepatitis C transmission, it is important to emphasize the possibility of sexual transmission. Most studies show that the chances of transmission are low or almost nil, ranging from 0% to 3%. In-home transmission is strongly considered and mentioned as a confounding factor when it is related to transmission between couples, as sharing of personal hygiene items such as razors, toothbrushes, manicure pliers and nail clippers should be considered as a significant risk factor for the transmission of HCV within the household<sup>19</sup> and the sharing of these materials within the prison may be associated as predictor behavior, but no studies have been found related to these specific risks within prisons.

It should be noted that a study conducted in Passos, Minas Gerais, with the objective of analyzing risk behaviors in 185 prisoners, despite not having identified a positive case for HCV, found that the majority of detainees had a high prevalence of risk factors, making them more vulnerable to contamination. These factors included unprotected sexual practices, drug use, tattooing and needle sharing within the prison.<sup>20</sup>

HCV is transmitted more efficiently parenterally due to high or repeated exposure to blood and its infected products or transplantation of infected tissue or organs. Thus, the risks are greater for intravenous drug users, people with tattoos and piercings or who have had other forms of skin exposure and also individuals who received blood transfusion before 1993. HCV is believed to be the major responsible for cirrhosis and liver transplantation.<sup>21</sup>

The relative mutability of the HCV genome has been blamed for its high propensity to cause chronic infection. About 80% of new infections progress to chronic infection, with cirrhosis developing by about 20% after 20 to 30 years, resulting in increased risk of complications related to liver

and hepatocarcinoma. The high mutability of the HCV genome and limited knowledge on the protective immune response after infection have hindered progress in vaccine development. For this reason, there is as yet no vaccine available against hepatitis C virus.<sup>22</sup>

In view of the above, it is noticed that the prevalence rates of HCV in prisons are higher than in the community. This is due to limited access to supplies such as nail clippers, shavers, condoms, and risky practices such as non-sterile tattoos and piercings, as well as homosexual sexual practices, sexual assault and non-injectable and injectable drug sharing.<sup>5</sup>

Prisoners tend to import into the prison the behavior pattern outside the prison, hence the importance of screening at the entrance to the prison, so as to provide adequate clinical guidance for all those infected with the Hepatitis C virus. Due to the lack of vaccine or effective post-exposure prophylaxis, the main focus of hepatitis C prevention is on the recognition and control of these risk factors.

## CONCLUSION

The selected studies evidenced a wide variation in the prevalence of hepatitis C depending on the population studied, with predominance of injecting drug users; with a history of blood transfusion; presence of tattoo; age between 30 and 69 years and previous history of STD. The level of evidence of the articles was related to the cross-sectional and descriptive studies, identifying knowledge gaps in the direction of the production of research of better scientific evidence as the production of randomized clinical trials.

Although the understanding of the dynamics of transmission of infectious diseases among prisoners is fundamental to guiding preventive programs, it is noteworthy the low scientific production of epidemiological studies in our country related to this population. Because it is an asymptomatic long-term disease, which hinders its early diagnosis, hepatitis C proves to be a relevant problem in the Brazilian prison system, requiring more attention in order to produce knowledge that guides the adoption of effective measures of control and prevention.

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