







Hepatitis B vaccine adherence among homeless people*

Adesão à vacina contra hepatite B entre pessoas que vivem em situação de rua

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ABSTRACT

Objective: to estimate the adherence to hepatitis B vaccine in homeless people. **Methods:** a cross-sectional study with 90 homeless people, with the collection of 5 ml of blood for the detection of antibody against the surface antigen of the hepatitis B virus. **Results:** of the total, 89 (98.9%) were vaccinated with the first dose; of these, 45 (50.7%) had antibodies against hepatitis B virus surface antigen lower than 10 IU/L; 25 (53.3%) received the second dose of hepatitis B vaccine, and nine (45.8%) participants received the third dose of vaccine. Individuals who were related to both genders were more likely to adhere to the full hepatitis B vaccine schedule. **Conclusion:** the low adherence to hepatitis B vaccination and the small number of participants with antibodies that confer immunity against this infection were evidenced.

Descriptors: Homeless Persons; Hepatitis B; Immunization Schedule; Vaccination.

RESUMO

Objetivo: estimar a adesão à vacina contra a hepatite B em pessoas que vivem em situação de rua. **Métodos:** estudo transversal com 90 pessoas que vivem em situação de rua com a coleta de 5ml de sangue para a detecção do anticorpo contra o antígeno de superfície do vírus da hepatite B. **Resultados:** do total, 89 (98,9%) foram vacinados com a primeira dose; desses, 45 (50,7%) apresentaram anticorpo contra o antígeno de superfície do vírus da hepatite B inferior a 10 UI/mL; 25 (53,3%) receberam a segunda dose da vacina contra a hepatite B e nove (45,8%) participantes receberam a terceira dose de vacina. Indivíduos que mantinham relação com ambos os gêneros tiveram maior chance de aderir ao esquema completo da vacina contra a hepatite B. **Conclusão:** evidenciaram-se a baixa adesão à vacina contra a hepatite B e o número reduzido de participantes com anticorpos que conferem imunidade contra essa infecção.

Descritores: Pessoas em Situação de Rua; Hepatite B; Esquemas de Imunização; Vacinação.

Introduction

The magnitude of the Hepatitis B Virus (HBV) is high, since it affects more than two billion people, and of these, 325 million remain chronically infected⁽¹⁾. The health impacts of HBV are high and worrying due to the possibility of hepatic complications and also because it is an immuno-preventable infection through administration of the hepatitis B vaccine⁽²⁻³⁾.

Thus, in order to reduce and eliminate the infections caused by viral hepatitis, the World Health Organization (WHO) prepared a document entitled Global Health Sector Strategy on Viral Hepatitis 2016-2021: Towards Ending Viral Hepatitis, which aims to establish global strategies to achieve the goal of eliminating viral hepatitis as a public health problem by 2030 and proposes to decrease new cases by 90.0% and reduce mortality by up to 65.0%⁽⁴⁾. It is important to conduct studies with the objective of reducing the rates of this infection in vulnerable populations such as people living on the streets, since most of them are socially marginalized.

In this context, the difficulty of access to health services and the social and behavioral characteristics of some populations make them more exposed and at increased risk of acquiring hepatitis B. In a study conducted in the central region of Brazil with people living on the streets, 4.5% showed the serological marker that indicates previous contact with HBV and 0.6% remained with this active infection, showing the high prevalence of contact with the virus⁽⁵⁻⁶⁾.

The homeless population is characterized by being young, predominantly male, with high mortality and greater susceptibility to HBV infection due to factors such as prolonged exposure to the risk of infection, limited access to health services, consumption of alcohol and other drugs, high prevalence of sexually transmitted infections (STI), inconsistent condom use and low vaccination against hepatitis B⁽⁷⁻⁸⁾.

The national and international literature shows low vaccination coverage among people in situations

of greater social vulnerability, such as people living on the streets, thus considered susceptible to HBV infection⁽⁹⁻¹⁰⁾. Therefore, it is necessary that the existing vaccination programs in the country be directed to the target populations, reducing the low vaccination coverage rates and interrupting the virus transmission chain.

Studies with active vaccination interventions against HBV in this population are still scarce. Thus, this study aimed to estimate the adherence to hepatitis B vaccine in homeless people.

Methods

A cross-sectional study was conducted in the Specialized Reference Center for the homeless population, called Pop Center, in Teresina, Piauí, Northeast region of Brazil, in the period from September 2017 to June 2018.

The study population consisted of people living on the streets who sought the Pop Center during data collection. The recruitment of participants was carried out through the non-probabilistic sampling technique by convenience through a verbal invitation. The following inclusion criteria were adopted: age ≥ 18 years; living on the streets for at least three months; agreeing to the collection of blood samples; agreeing to take the vaccine and return to the Reference Center to receive the test results and other doses of hepatitis B vaccine. Individuals who showed violent behavior at the time of the interview were excluded.

Data collection was based on interviews using a sociodemographic and behavioral form developed by the researchers to investigate the following variables: sociodemographic (origin, sex, age, years of study, skin color, marital status, profession/occupation and monthly income); behavioral (sexual orientation, coitus, sexual practice, sexual partnership, condom use in sexual intercourses and sharing of sharp objects) and hepatitis B vaccination status.

The data collection procedure took place du-

ring three face-to-face meetings with each participant, called stages for the conduct of the study. The first stage consisted of three activities that occurred on the same day: filling out the sociodemographic and behavioral form; collection of 5ml of blood by peripheral venipuncture for the detection of antibody against hepatitis B virus surface antigen (HBsAg) and administration of the first dose of hepatitis B vaccine to avoid missed opportunities, considering this is a population with difficult access, and this strategy has also been used by other researchers to avoid losses⁽¹¹⁻¹²⁾.

The vaccine doses were administered intramuscularly (deltoid muscle) and dosed according to the orientation of the Ministry of Health⁽¹¹⁾. The vaccine used was manufactured by LG Life Sciences (lots: WVX-16014 and WVX-16016) and Serum Institute of India (lots: 035L6022, 035L6023, 035L6033, 035L6048, and 035P60360E). The administered dose was recorded on the vaccination card and in a logbook.

The second step occurred seven days after the first intervention, when the date to receive the test result (HBsAg) was scheduled, exactly seven days after the date of administration of the first dose of hepatitis B vaccine. On this day, the participants were informed about the need or not to receive subsequent doses of the vaccine according to the Ministry of Health calendar (0, 1, and six months).

The third step consisted in evaluating the protective titers of HBV vaccination. The participants who presented test results with levels higher than 10 IU/L were considered immune to HBV infection and, therefore, there was no need to apply subsequent doses⁽¹¹⁻¹²⁾. People with HBsAg titers <10 IU/L, i.e. still susceptible to the virus, were instructed to return 30 days later to receive the second dose of vaccine. Participants who returned after this deadline were advised to return six months after the first dose to receive the third dose of vaccine.

Participants received a vaccination card, where the administered doses of hepatitis B vaccine and

the schedule with the dates of subsequent doses were recorded, in addition to receiving guidance on the importance of returning on the scheduled dates and the completion of the vaccination schedule. In this study, satisfactory adherence was considered to be the participant who received all three doses of hepatitis B vaccine in accordance with the recommendations of the Ministry of Health at 0, 1, and six months⁽¹¹⁾. The absence of the participants on the previously scheduled days was considered as a loss.

The data obtained were tabulated and coded in Microsoft Excel and later exported for analysis in the Statistical Package for the Social Sciences, version 20. A descriptive statistical analysis of absolute and percentage frequency was performed. The Chi-square test was applied and the Odds ratio (OR) was calculated with its respective 95% confidence interval (95% CI). The confidence level adopted for the study was 5%.

The research was conducted following all ethical precepts required by the National Health Council Resolution No. 466/12 and its supplements. Thus, the research participants were asked to sign the Informed Consent Form and all had the right to refuse to participate in the research at any time. The eligible participants were informed about the objectives of the study and the importance of participating in all the stages. This study was approved by the Research Ethics Committee of the Federal University of Piauí with protocol No. 1,755,893/2016.

Results

After the serological examination, 44 (49.3%) had reagent results for the HBsAg serological marker and, therefore, did not continue with the hepatitis B vaccination scheme. Thus, of the 45 (50.6%) who had HBsAg lower than 10 IU/L, 34 (53.3%) received the second dose of hepatitis B vaccine, and of these, nine (45.8%) received the third dose of vaccine (Figure 1).

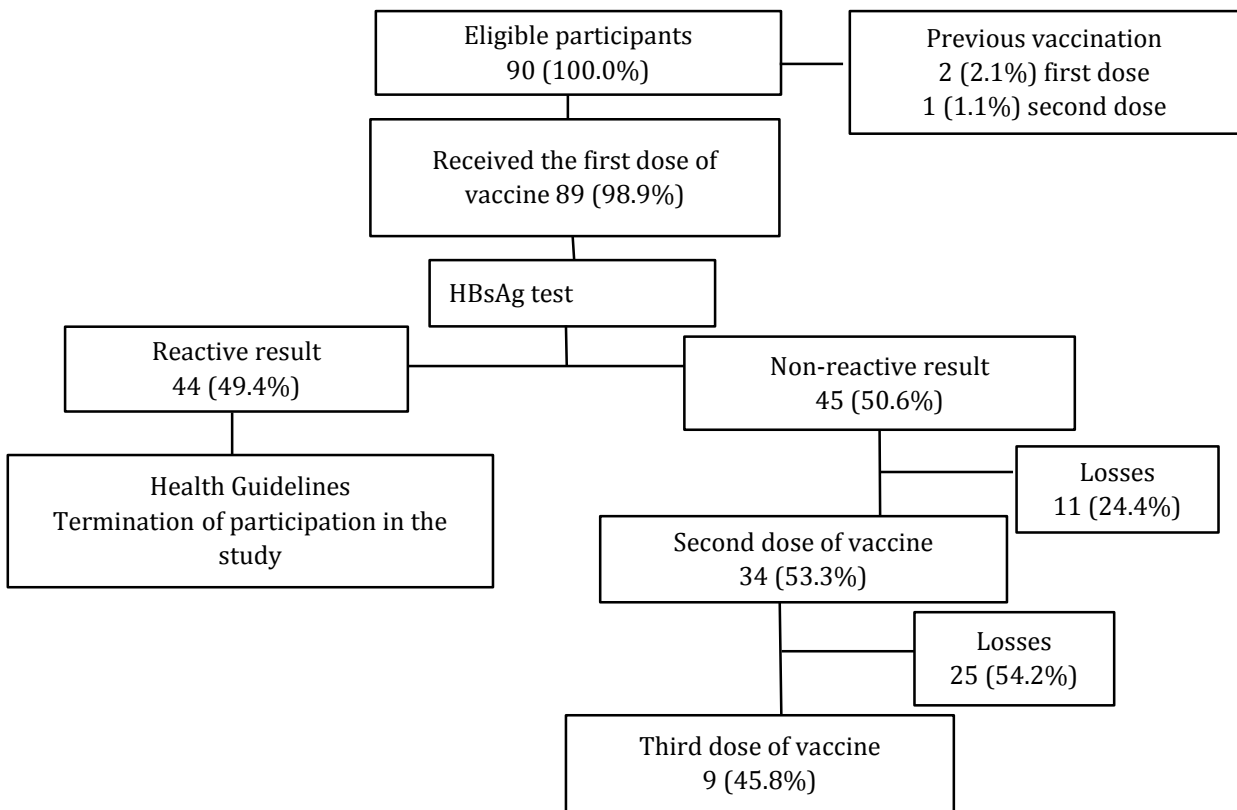


Figure 1 – Flowchart of hepatitis B vaccination in people living on the streets. Teresina, PI, Brazil, 2017-2018

The majority of the participants were male (83.3%), from states in the Northeast of the country (91.1%), and formed by young adults aged 33 to 40 years (32.2%). In addition, 89.0% reported attraction for the opposite sex and 5.5% reported feeling attraction for both sexes. As for education, 15.6% reported no years of study. Of the total, 65.6% declared themselves as brown/yellow skin color, 83.4% had no partner, 75.5% reported having a profession, and 51.7% had no income. Chances were considered null

when the OR confidence interval included a value of 1

Thus, none of them showed a cause and effect relationship with the complete hepatitis B immunization scheme (Table 1).

Individuals who reported earlier sexual intercourse were more likely to adhere to the vaccine when compared to those with coitals older than 15 years. However, in this study, none of the behavioral factors interfered with vaccine adherence (Table 2).

Table 1 – Sociodemographic characteristics to adherence to hepatitis B vaccination scheme of people living on the streets. Teresina, PI, Brazil, 2017-2018

Variables	Complete scheme			p-value*	Odds ratio (95%CI)
	Total	Yes	No		
	n (%)	n (%)	n (%)		
Sex					
Male	75 (83.3)	7 (9.3)	68 (90.7)	0.639	0.67 (0.12 – 3.59)
Female	15 (16.7)	2 (13.3)	13 (86.7)		1
Age group (years)					
20 to 25	10 (11.1)	1 (10.0)	9 (90.0)	0.567	1.03 (0.96 – 11.25)
26 to 32	20 (22.2)	3 (15.0)	17 (85.0)		1.65 (0.29 – 9.11)
33 to 40	29 (32.2)	2 (6.9)	27 (93.1)		0.69 (0.11 – 4.46)
> 40	31 (34.5)	3 (9.7)	28 (90.3)		1
Education					
With formal education	76 (84.4)	8 (10.5)	68 (89.5)	0.700	1.53 (0.18 – 13.29)
Without formal education	14 (15.6)	1 (7.1)	13 (92.9)		1
Origin					
Northeast	82 (91.1)	7 (8.5)	75 (91.5)	0.161	0.28 (0.05 – 1.66)
Other regions	8 (8.9)	2 (25.0)	6 (75.0)		1
Skin Color					
White	11 (12.2)	1 (9.1)	10 (90.9)	0.105	1.38 (0.14 – 13.61)
Black	20 (22.2)	4 (20.0)	16 (80.0)		3.44 (0.77 – 15.31)
Brown/Yellow	59 (65.6)	4 (6.8)	55 (93.2)		1
Sexual orientation					
Both	5 (5.5)	2 (40.0)	3 (60.0)	0.051	6.95 (0.99 – 48.87)
Same sex	5 (5.5)	0 (0.0)	5 (100.0)		–
Opposite sexy	80 (89.0)	7 (8.8)	73 (91.3)		1
Marital status					
With partner	15 (16.6)	0 (0.0)	15 (100)	0.999	–
Without partner	75 (83.4)	9 (12.0)	66 (88.0)		1
Profession/occupation					
Yes	68 (75.5)	5 (7.4)	63 (92.6)	0.154	0.36 (0.09 – 1.47)
No	22 (24.5)	4 (18.2)	18 (81.8)		1
Monthly income					
With income	43 (48.3)	5 (11.6)	38 (88.4)	0.648	1.38 (0.34 – 5.52)
Without income	46 (51.7)	4 (8.7)	42 (91.3)		1

*Chi-square test; CI: Confidence interval

Table 2 – Sexual and/or risk behavior associated with adherence to the hepatitis B vaccination schedule of people living on the streets. Teresina, PI, Brazil, 2017-2018

Variables	Complete scheme			p-value*	Odds ratio (95%CI)
	Total	Yes	No		
	n (%)	n (%)	n (%)		
Age at first sexual intercourse (years)					
< 15	61 (70.9)	7 (11.5)	54 (88.5)	0.301	3.11 (0.36 – 26.70)
> 15	25 (29.1)	1 (4.0)	24 (96.0)		1
Sexual practice					
Anal	1 (1.1)	0 (0.0)	1 (100.0)	0.588	–
Vaginal	59 (66.3)	5 (8.5)	54 (91.5)		0.58 (0.14 – 2.34)
Oral	29 (32.6)	4 (13.8)	25 (86.2)		1
Sexual partner					
Fixed partner	20 (22.2)	2 (10)	18 (90.0)	0.141	0.63 (0.12 – 3.44)
Eventual partner	30 (33.3)	1 (3.3)	29 (96.7)		0.19 (0.22 – 1.72)
Without partner	40 (44.5)	6 (15.0)	34 (85.0)		1
Use of a condom					
Yes	29 (32.2)	2 (6.9)	27 (93.1)	0.503	0.57 (0.11 – 2.94)
No	61 (67.8)	7 (11.5)	54 (88.5)		1
Sharing of sharp objects					
Yes	6 (6.6)	0 (0.0)	6 (100.0)	0.999	–
No	84 (93.4)	9 (10.7)	75 (89.3)		1

*Chi-square test; CI: Confidence interval

Discussion

As a limitation, the fact that this was a floating population, difficult to approach and with low education level was identified, which may have resulted in factors that increased the loss of participants and low adherence to the three-dose hepatitis B vaccination scheme. Moreover, the fact that participants had higher titers than recommended for immunization and the impossibility of contact with participants who missed the hepatitis B vaccine doses may have compromised the completeness of the vaccination schedule.

Considering that this is a population with difficult access, this study provided people living on the streets with the opportunity to receive hepatitis B vaccination and be tested for their serological status⁽¹³⁾. Thus, it contributes to the planning of new strategies and to the reduction of injuries, with health promotion and prevention. In addition, it showed the importance of welcoming this population into the health

care spaces for better assistance and bonding with the health system.

As for sociodemographic characteristics, similar profiles are found in other countries, such as the USA, China, Iran and Italy^(6,14) as well as in the Midwest region of Brazil⁽⁵⁾. The scenario of a young adult population aging on the streets is worrisome, since this situation predisposes to continuous exposure to agents that cause infections, increasing the possibility of contracting HBV. A study conducted in the United States pointed out that being homeless at 24 years of age or younger was associated with a higher probability of having unprotected sex and having multiple sexual partnerships⁽¹⁴⁻¹⁵⁾.

Regarding skin color, brown/*morena* skin color had an increased risk of not adhering to the follow-up of the vaccination schedule, although no significant value was found, which corroborates the reality found in the international scenario. The frequency of people who self-reported to be non-white is similar to that of a study conducted with the homeless population

in the United States^(13,16). Historically, people of black, brown and indigenous skin color represent more vulnerable populations, with fewer educational opportunities and, consequently, lower income and greater potential for residential instability, a predictor of HBV exposure⁽¹⁷⁾.

The study showed low hepatitis B vaccination completeness in people living on the street. In general, low coverage and adherence to hepatitis B vaccination is observed in vulnerable populations around the world, such as in England and Canada^(15,17). In Brazil, another study developed in the central region showed low adherence to hepatitis B vaccination, with 23 (23.9%) participants completing the three-dose vaccination schedule⁽⁵⁾.

The low adherence to hepatitis B vaccine may be related to the fact that the homeless population has limited access to health services, a factor that hinders the effectiveness of promotion and prevention measures. Because it is still a floating population, many of the participants were not present on the day and in the places scheduled for the doses, being geographic mobility a defining factor for adherence to the three-dose hepatitis B vaccination scheme according to the scientific literature^(12,18).

Moreover, unavailability on scheduled dates, imprisonment, refusal, and the recommended time interval between hepatitis B vaccine doses are factors associated with loss of follow-up^(12,17). The low adherence to the offered hepatitis B vaccine scheme reinforces the need for intervention research focused on this issue.

Although in this study, the vast majority reported feeling attraction only to the opposite sex, it was the individuals who reported feeling attraction to both sexes who were more likely (6.9%) to adhere to the full hepatitis B vaccination scheme. A relevant finding, since the literature indicates that risky sexual behavior is associated with increased exposure to hepatitis B virus⁽⁶⁻⁸⁾.

However, in this study, there were no statistically significant associations between non-adherence

to the hepatitis B vaccination scheme and sexual practices (anal, vaginal, oral), sexual partnerships (casual, fixed, no partner) and condom use. However, other studies have shown the different types of partnerships and the low use of condoms as risk factors for HBV infection^(7,18). This suggests that health promotion actions and guidance on condom use, regardless of the type of sexual partnership, should be encouraged in this population due to the high risk of acquiring an STI.

Regarding immunity against hepatitis B, the results showed that most participants were susceptible to HBV and should receive the first dose of hepatitis B vaccine, a worrisome situation in this study, considering the high concentration of HBV cases in vulnerable populations, which reaches 21.8% in some states of Brazil^(5,19).

The low adherence to the three-dose vaccination scheme against hepatitis B shows a worrisome situation, considering the high concentration of HBV cases in populations in situations of social vulnerability and risk behaviors. Given the above, there is an urgent need to improve the access of homeless people to health facilities in order to provide the opportunity to perform the hepatitis B vaccine.

Conclusion

The low adherence to hepatitis B vaccination and the small number of homeless participants with a hepatitis B virus surface antigen serological marker, which indicates protection through immunization, were evidenced.

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Colaborations

Oliveira VMC, Galvão MTG, Nunes RV, Carvalho MSM and Magalhães RLB contributed to the conception and design, data analysis and interpretation, writing of the manuscript and relevant critical review of the intellectual content. Gomes CNS contributed to the writing of the manuscript and relevant critical review of the intellectual content. All authors contributed to the final approval of the version to be published.

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