Revista da Sociedade Brasileira de Medicina Tropical
Journal of the Brazilian Society of Tropical Medicine
Vol.:52:e20180534: 2019
doi: 10.1590/0037-8682-0534-2018

Short Communication

Vaccination coverage and immunity against hepatitis B in public health dentists

***Cléa Adas Saliba Garbin*[1], *Ketlin Lara Tosta Vanzo*[1], *Suzely Adas Saliba Moimaz*[1], *Artênio José Ísper Garbin*[1] *and Fernando Yamamoto Chiba*[1]**

[1]. Departamento de Odontologia Infantil e Social, Faculdade de Odontologia de Araçatuba, Universidade Estadual Paulista "Júlio de Mesquita Filho", Araçatuba, SP, Brasil.

Abstract

Introduction: Occupational exposure is a major risk factor for hepatitis B (HB) transmission. **Methods:** Vaccination coverage and immunity verification from 64 dentists of the Brazilian Unified Health System were investigated. An immunochromatographic method was used to verify immunity against the disease. **Results:** Overall, 77.77% of participating dentists completed the vaccination schedule; 37.50% had negative anti-HBs test results. Furthermore, 60.93% of participants never underwent anti-HBs tests and 40% did not know how to correctly interpret results. **Conclusions:** Numerous dentists were not immune to the disease. Few participants previously performed the test, with many not knowing how to interpret the results.

Keywords: Hepatitis B. Vaccination Coverage. Immunization. Dentists.

Hepatitis B (HB) is considered a serious public health problem worldwide. According to the World Health Organization, it is estimated that 240 million people in the world are carriers of the chronic form of the disease, and approximately 690 thousand people die annually due to liver cancer or cirrhosis, which are complications arising from the evolution of the disease[1]. In Brazil, the number of hepatitis cases reported by the Information System for Notifiable Diseases from 1999 to 2016 was 561,058[2].

Among all the known means of transmission, occupational exposure is considered a major risk factor for HB transmission. In this context, dentists are highly susceptible to exposure and contamination within the clinical practice scenario and should therefore be aware of and alert to the measures and practices of care and prevention of this disease[3].

Vaccination is considered the main preventive method against the disease[4]. It is a safe and efficient measure that is available in the Brazilian National Health System, and it is free of charge for all citizens[5]. The vaccine is intramuscularly administered in three doses at 0, 1, and 6 months, and immunization can be achieved after completing the vaccination schedule in 90% to 95% of the cases[6]. Thirty days after the third dose, it is important to confirm the development of immunity by testing for the presence of anti-HBs antibodies in the organism[7].

The anti-HBs test is a method seldom used by health professionals to verify disease immunity because this approach is poorly reported in the literature, so more actions could be developed for the method to be adopted as a systematic preventive practice to confirm the vaccination coverage against hepatitis B[5].

Considering the serious consequences of HB infection and the scarcity of research studies addressing the verification of immunity to the virus in dentists, the purpose of this study is to evaluate the vaccination coverage against hepatitis B, the vaccination results, and previous performance and interpretation of the anti-HBs test results in dentists of the Brazilian Unified Health System.

This is a cross-sectional quantitative study carried out with Brazilian Unified Health System dentists working in basic health units within 9 cities of the São Paulo state. All dentists enrolled in the National Registry of Health Establishments were invited to participate in the study. Professionals who were unlicensed, retired, or did not accept the invitation to perform the anti-HBs test were excluded from the study. Of the 74 dentists enrolled in the National Registry of Health Establishments, 64 (86.48%)

Corresponding author: Prof. Dr. Fernando Yamamoto Chiba.
e-mail: fernandochiba@foa.unesp.br
Orcid: 0000-0003-4406-405X
Received 13 December 2018
Accepted 15 April 2019

accepted the offer to participate in the study. The study was approved by the research ethics committee according to protocol number CAAE: 54227416.0.0000.5420. Regulatory norms for research involving human beings were followed in accordance with Resolution 466/2012 of the National Health Council of the Brazilian Ministry of Health and in keeping with the Helsinki Declaration.

A questionnaire was applied to evaluate the following variables: socio-demographic conditions, a complete vaccination schedule against hepatitis B, performance of the anti-HBs test, knowledge of the significance of the test result, vaccine immunity duration, and guidelines on the disease. The anti-HBsAg® kit (Wama, Brazil) was used to verify immunity to HB. It is an immunochromatographic test used to detect the presence of anti-HBsAg antibodies in the blood.

The statistical analyses were completed using the software Epi Info version 7.0. A descriptive statistical analysis of the data was performed, and chi-square and Fisher's exact tests at a significance level of 5% ($\alpha = 0.05$) were used to verify any association between the variables.

TABLE 1: Sociodemographic profile of dentists of the Brazilian National Health System, 2018.

Variable	n	%
Gender		
Female	40	62.50
Male	24	37.50
Total	64	100.00
Age Group		
21 to 35 years	10	15.63
36 to 46 years	29	45.31
47 to 57 years	17	26.56
58 years and over	8	12.50
Total	64	100.00
Experience Time		
Less than 5 years	4	6.25
Between 5 and 15 years	11	17.19
Between 16 and 26 years	33	51.56
Greater than 26 years	16	25.00
Total	64	100.00
Public Service Time		
Less than 5 years	11	17.18
Between 5 and 15 years	18	28.13
Between 16 and 26 years	27	42.19
Greater than 26 years	8	12.50
Total	64	100.00
Educational Level		
Without specialization	28	43.75
With specialization	36	56.25
Total	64	100.00

Of the 64 dentists, the majority were women (62.50%) and predominantly in the age range of 36–46 years (45.31%), with a mean age of 44.55 years old. It was also noticed that most of the professionals had worked in public service for more than 15 years (54.69%) and had some specialization (56.25%) (**Table 1**).

Analysis of the vaccine doses the participants had received revealed that the majority (77.77%) had completed the vaccination schedule (**Table 2**). Regarding the anti-HBs test performed by dentists, the majority had a positive result (62.50%); however, it was observed that 37.50% of the participants presented negative results (**Table 2**). As observed in **Table 2**, most dentists had never performed the anti-HBs test (60.93%). It was verified that among the 25 participants who had previously performed the test, the majority (60.00%) had knowledge of the correct meaning of the results.

Table 3 shows that most dentists who completed the vaccination schedule had a positive result (82.50%) for the anti-HBs test. It is noted that 66.67% of the participants who tested negative reported receiving all doses of the vaccine. No significant association was found between a full vaccination schedule and anti-HBs test results. There was no significant association between receipt of the complete vaccination schedule and prior knowledge of the anti-HBs test (**Table 3**). The results show that most dentists completed the vaccination schedule and also received guidance on the disease (78.69%). Results revealed there was no significant association between the variables (**Table 3**).

Regarding knowledge about the duration of immunity provided by the vaccine, approximately half of the participants answered that they are immune for life, believing that once the immunity is confirmed, there is no need to repeat administration of the vaccine (**Table 2**).

The present study demonstrated that most dentists had completed the hepatitis B vaccine schedule; however, a great proportion of the professionals tested negative for the anti-HBs test, had never performed the test, and were not able to correctly interpret the result.

Studies have shown there is a need to increase professional awareness about the practices of completing the vaccination schedule[8] and verifying immunity against the virus[4]. To meet this need, the National Viral Hepatitis Program of the Brazilian Ministry of Health was created in 2002, aiming to establish immunization strategies and guidelines in the various sectors and levels of healthcare service in the national unified health system[9]. Thus, incorporating systematic measures to verify immunity in relation to already consolidated actions and strategies of promotion, prevention and healthcare represents an important step in improving adherence within high-risk populations.

Study results showed that less than half of the participating dentists had previously performed the anti-HBs test. Similarly, other studies reported low adherence among the dentists to verify their immunity to HB[8]. Lack of guidance and lack of knowledge

TABLE 2: Results regarding the anti-HBs tests, previous tests, number of vaccine doses received, duration of immunity, and meaning of the anti-HBs test results among dentists of the Brazilian National Health System, 2018.

Anti-HBs test result	**n**	**%**
Negative	24	37.50
Positive	40	62.50
Total	64	100.00
Have you ever been tested for anti-HBs?	n	%
No	39	60.93
Yes	25	39.07
Total	64	100.00
How many doses of the vaccine have you received?	n	%
None	1	0.01
Two	3	4.76
Three	39	61.90
More than three	10	15.87
I don't know	11	17.46
Total	64	100.00
Does the vaccine provide immunity throughout life?	n	%
No	13	20.31
I don't know	20	31.25
Yes	31	48.44
Total	64	100.00
What does a positive anti-HBs test result mean for you?	n	%
I'm immune	12	48.00
I don't know	6	24.00
What does a negative anti-HBs test result mean for you?		
I'm not immune	3	12.00
I do not have the disease	3	12.00
I don't know	1	4.00
Total	25	100.00

TABLE 3: Relationship between dentists' answers regarding the completion of the vaccination schedule and its association with the anti-HBs test results, previous study tests, and guidance received on hepatitis B, 2018.

	Completed vaccination schedule						**Test**	***p*-value**
	No		**Yes**		**Total**			
	n	**%**	**n**	**%**	**n**	**%**		
Anti-HBs test results								
Negative	8	33.33	16	66.67	24	100.00	Chi-square	0.2531
Positive	7	17.50	33	82.50	40	100.00		
Have you undergone the anti-HBs test?								
No	12	30.77	27	69.23	39	100.00	Fisher's exact test	0.1304
Yes	3	12.00	22	88.00	25	100.00		
Have you been given guidance on hepatitis B?								
No	2	66.67	1	33.33	3	100.00	Fisher's exact test	0.1344
Yes	13	21.31	48	78.69	61	100.00		

on the importance of implementing the anti-HBs test are among the main causes[10]. Interestingly, in the present study, it was found that more than half of the participants had some specialization. Thus, although the issue may be specifically addressed during undergraduate courses and some complementary training courses, it is still necessary to implement an approach that promotes consolidation of knowledge in a continuous way that includes adoption of control and prevention practices for this disease in the dental field[11].

With regard to vaccination coverage, it was observed that the majority of the participants had completed the vaccination scheme, which is in agreement with the guidelines of the National Immunization Program[12,13]. However, it was observed that approximately a quarter of the dentists had not completed the vaccination schedule. Other studies also point to the existence of a significant proportion of dentists who did not complete the hepatitis B vaccination regimen[8,14]. Among the factors interfering with the completion of the vaccination schedule, the literature shows that there is a misperception about the risks of infection, a lack of information on the means of transmission, fear of vaccine side effects, and a concern about difficult access to vaccinations[14]. Another factor that may influence the efficiency of the complete vaccination schedule is non-compliance with the number of doses and the interval between them. This leads to forgetfulness or misleading results, as the practitioner may think that only one or two doses will be enough to stimulate adequate immunity[15].

It was observed that the anti-HBs test showed a positive result in most of the participants, although there were a significant number of individuals who presented negative results despite completing the vaccination scheme. It should be noted that completing a full vaccination schedule does not guarantee immunity against HB in the individuals, as they can remain exposed to the risks of infection[6]. This condition may occur due to inadequate administration of the vaccine, inadequate time intervals between doses, and individual factors such as smoking, obesity, renal failure, immunosuppression, and hepatic diseases[10].

The anti-HBs test aims to check immunity against hepatitis B through specificity of the detection of antibodies against the virus, unlike the diagnostic test for hepatitis B that checks for the presence of the virus. These two tests can be confused, as observed in this study. Some professionals reported having previously performed the anti-HBs test, and they interpreted their negative results to mean they were not infected by HB. Approximately half of the participants stated that the immunity provided by the vaccine is lifelong, believing that there is never a need to re-administer the vaccine once the vaccination schedule is fully completed. However, it is known that this assertion is not true, since there is the possibility of a decline in antibody levels, making it essential to re-administer the anti-HBs test as the years progress[10]. Levels of HB antibodies may decline over the years due to a number of factors, such as genetics, advanced age, and general health complications of the individual[10].

Sample selection excluding dentists who refused to perform the anti-HBs test may be considered a limitation of the study, since professionals who avoid carrying out the preventive action against hepatitis B may be the most vulnerable to the disease. Moreover, the sample was composed only of dentists working in basic health units within the Brazilian Unified Health System, which can result in a sample with characteristics different from professionals who only work in private clinics.

The findings showed that most of the dental professionals had completed the vaccination schedule and received guidance about the disease. Although most of them tested positive for anti-HBs, a considerable number of participants were not immune to the disease. Only a small number of dentists had performed the test before, and several did not know how to interpret the results. The data highlights the need for changes in health promotion and prevention policies in order to make health professionals aware of the importance of incorporating systematic measures to verify immunity to hepatitis B.

Conflict of interest

The authors declare that there is no conflict of interest.

Financial Support

This work was supported by the Coordination for the Improvement of Higher Education Personnel (CAPES).

REFERENCES

1. World Health Organization (WHO). Guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection. Geneva: WHO; 2015. 166 p.
2. Ministério da Saúde (MS). Secretaria de Vigilância em Saúde. Departamento de Vigilância, Prevenção e Controle das IST, do HIV/Aids e das Hepatites Virais (DIAHV). Boletim epidemiológico de hepatites virais. Brasília: MS; 2018. 68 p.
3. Dahiya P, Kamal R, Sharma V, Kaur S. "Hepatitis" - Prevention and management in dental practice. J Educ Health Promot. 2015;4:33. doi: 10.4103/2277-9531.157188.
4. Tauil MC, Amorim TR, Pereira GFM, Araújo WN. Mortalidade por hepatite viral B no Brasil, 2000-2009. Cad Saúde Pública. 2012;28(3):472-8.
5. Garbin AJI, Wakayama B, Garbin CAS. Negligência no autocuidado em saúde: a imunização contra a Hepatite B na Odontologia. Arch Health Invest. 2016;5(2):85-9.
6. Lu J, Yan B, Liu J, Wu W, Feng Y, Xu A, et al. Comparison of anti-HBs persistence after hepatitis B vaccination on two-dose schedule and three-dose schedule among adults: results from a 12-year follow up study in China. Hum Vaccin Immunother. 2019;15(5):1171-6. Nov 30. doi: 10.1080/21645515.2018.1554972. [Epub ahead of print]
7. Kubba AK, Taylor P, Graneek B, Strobel S. Non-responders to hepatitis B vaccination: a review. Commun Dis Public Health. 2003;6(2):106-12.
8. Martins AMEBL, Costa FM, Ferreira RC, Santos Neto PE, Magalhaes TA, Sá MAB, et al. Factors associated with immunization against Hepatitis B among workers of the Family Health Strategy Program. Rev Bras Enferm. 2015;68(1):84-92.
9. Ferreira PRA, Brandão-Mello CE, Estes C, Gonçales Júnior FL, Coelho HSM, Razavi H, et al. Disease burden of chronic hepatitis C in Brazil. Braz J Infect Dis. 2015;19(4):363-8.
10. Arias-Moliz MT, Rojas L, Liébana-Cabanillas F, Bernal C, Castillo F, Rodríguez-Archilla A, et al. Serologic control against hepatitis B

virus among dental students of the University of Granada, Spain. Med Oral Patol Oral Cir Bucal. 2015;20(5):e566-71.

11. Garbin AJI, Garbin CAS, Arcieri RM, Crossato M, Ferreira, NF. Biosecurity in public and private office. J Appl Oral Sci. 2005;13(2):163-6.
12. Souto JFD. Distribution of hepatitis B infection in Brazil: the epidemiological situation at the beginning of the 21 st century. Rev Soc Bras Med Trop. 2016;49(1):11-23.
13. Tonial GC, Passos AM, Livramento A, Scaraveli NG, Batschauer APB, Bueno EC, et al. Hepatitis B marker seroprevalence and vaccination coverage in adolescents in the City of Itajaí, State of Santa Catarina, Southern Brazil, in 2008. Rev Soc Bras Med Trop. 2011;44(4),416-9.
14. Assunção AA, Araújo TM, Ribeiro RBN, Oliveira SVS. Hepatitis B vaccination and occupation exposure in the healthcare sector in Belo Horizonte, Southeastern Brazil. Rev Saúde Pública. 2012;46(4):665-73.
15. Ghomraoui FA, Alfaqeeh FA, Algadheeb AS, Al-Alsheikh AS, Al-Hamoudi WK, Alswat KA. Medical students' awareness of and compliance with the hepatitis B vaccine in a tertiary care academic hospital: An epidemiological study. J Infect Public Health. 2016;9(1):60-5.