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REVISTA PREVENÇÃO DE INFECÇÃO E SAÚDE (REPIS)

Vacinação e soroconversão do vírus da hepatite B em ingressantes de graduação em enfermagem: risco velado

Hepatitis B virus vaccination and seroconversion in undergraduate nursing graduates: veiled risk

Vacunación contra el virus de la hepatitis B y seroconversión en graduados de enfermería de pregrado: riesgo velado

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ABSTRACT

Objective: To evaluate the vaccination status and the seroconversion conferred by the hepatitis B vaccine among undergraduate nursing students, before the beginning of the theoretical-practical academic activities. **Method:** analytical cross-sectional study, conducted with 102 participants. Collection performed through self-administered structured questionnaire, vaccination portfolio analysis and rapid test for detection of Anti-HBsAg. Results were analyzed using SPSS version 20.0 for descriptive analysis and Chi-square test. **Results:** It was found that the vaccination schedule was complete in 87.3% of college students and, of these, 48% did not develop seroconversion. **Conclusion**: The present study reveals the vulnerability of undergraduate nursing students to acquire hepatitis B virus infection during their professional training activities, showing that nursing professionals may be at occupational risk even during their nursing training.

Descriptors: Hepatitis B; Hepatitis B Virus; Seroconversion; Students, Nursing; Vaccination.

RESUMO

Objetivo: avaliar a situação vacinal e a soroconversão conferida pela vacina da hepatite B entre ingressantes do curso de graduação em enfermagem, antes do início das atividades acadêmicas teórico-práticas. **Método:** estudo analítico, transversal, desenvolvido com 102 participantes. Coleta realizada através de questionário estruturado autoaplicável, análise da carteira de vacinação e realização de teste rápido para detecção do Anti-HBsAg. Resultados foram analisados com o auxílio do SPSS versão 20.0, para análise descritiva e teste de Qui-quadrado. **Resultados:** verificou-se que o esquema vacinal estava completo em 87,3% dos estudantes universitários e, destes, 48% não desenvolveram a soroconversão. **Conclusão**: O presente estudo revela a vulnerabilidade de acadêmicos ingressantes do curso de graduação em enfermagem para a aquisição da infecção pelo vírus da hepatite B durante suas atividades de formação profissional, mostrando que os profissionais da enfermagem podem estar em risco ocupacional mesmo durante seu processo de formação.

Descritores: Hepatite B; Vírus da Hepatite B; Soroconversão; Estudantes de Enfermagem; Vacinação.

RESUMÉN

Objetivo: Evaluar el estado de vacunación y la seroconversión conferida por la vacuna contra la hepatitis B entre los estudiantes de primer año del curso de graduación en enfermería, antes del inicio de las actividades académicas teóricas y prácticas. **Método:** estudio analítico de corte transversal, realizado con 102 participantes. Colección realizada a través de cuestionario estructurado autoadministrado, análisis de portafolio de vacunación y prueba rápida para detección de Anti-HBsAg. Los resultados se analizaron utilizando SPSS versión 20.0 para el análisis descriptivo y la prueba de Chi-cuadrado. **Resultados:** Se encontró que el calendario de vacunación se completó en el 87.3% de los estudiantes universitarios y, de estos, el 48% no desarrolló seroconversión. **Conclusión**: El presente estudio revela la vulnerabilidad de los estudiantes universitarios de enfermería para adquirir la infección por el virus de la hepatitis B durante sus actividades de capacitación profesional, lo que demuestra que los profesionales de enfermería pueden estar en riesgo ocupacional incluso durante su proceso de formación en enfermería.

Descriptores: Hepatitis B; Virus de la Hepatitis B; Seroconversión; Estudiantes de Enfermería; Vacunación.

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INTRODUCTION

According to the World Health Organization (WHO), viral hepatitis is considered one of the biggest health problems and causes twice as many deaths compared to AIDS. In Brazil, the Ministry of Health (MS) estimates that 15% of the population has already been exposed to hepatitis B virus (HBV). From 1999 to 2018, 233,027 confirmed cases of hepatitis B were reported; Of these, most are concentrated in the Southeast region (34.9%) and the chronic clinical form (72.5%).[1]

Corroborating the actions to combat this disease, the National Immunization Plan made available, as of 2016, the vaccine for all population regardless of age and vulnerability, with the aim of reducing the endemicity of the disease.[2]

Nursing professionals, in addition to representing the largest staff in health services, become more vulnerable to HBV because they are directly exposed to various types of occupational hazards and because they handle perforating sharps and continually contaminated body fluids. Still, it is estimated that between 6 and 30% of these professionals can become infected when they do not adopt the recommended prophylactic measures.[2,3]

Nursing students are considered the second most vulnerable category in health services. In the daily curriculum framework for vocational training, academics develop theoretical and scientific learning by performing practical activities in the clinical and care settings with patients, environments where they are constantly exposed to occupational risks involved in health care and physical, biological and psychosocial aggression.[4,5]

Preventive measures of occupational hazards point to vaccination as an efficient procedure against communicable diseases in health services. To determine the effectiveness of vaccination, there is a need to evaluate the immune response, ie seroconversion, against the viral antigen. Confirmation of seroconversion can be performed by serological tests for specific antibody detection after a complete vaccination schedule. About 5 to 10% of vaccinated individuals do not have sufficient antibody titration for their full protection and in these cases complete revaccination is required.[6]

Given the above, the following research question was established: What is the vaccination situation for type B viral hepatitis and the real protective immunological situation of university students entering the undergraduate nursing courses of a public Higher Education Institution in the interior of the São Paulo state?

Thus, the objective of this study was to evaluate the vaccination status and seroconversion conferred by the hepatitis B vaccine among undergraduate nursing students before the beginning of academic activities in health services.

METHODS

It is an analytical and cross-sectional study. The inclusion criteria adopted in the study were: students of both sexes, over 18 years old, entering the Bachelor of Nursing and Bachelor of Nursing courses from a public Higher Education Institution (HEI) in the interior of the

state of. Sao Paulo, in the year 2016. 130 freshmen students were invited, however, the sample totaled 102 students, since 26 of them did not want to participate in the proposed investigation and 02 were under 18 years old.

Data on hepatitis B virus (HBV) vaccination were collected in the classroom using a self-administered structured questionnaire developed by the study authors and validated by researchers specializing in the subject, which was applied at the end of the first year of school. University graduate. The instruments for vaccine evaluation are not yet well established. For this reason, we chose to create a questionnaire with open and closed questions. The questions were addressed to sociodemographic and identification data, vaccine update information, vaccine knowledge, virus, contamination risks, and the importance of HBV vaccination.

Concomitant with the application of the questionnaire, a blood sample was collected by digital pulp puncture to detect the presence of specific antibodies against Hepatitis B Virus Surface Antigens (Anti-HBsAg) by the immunochromatographic method using the anti-HBsAg immuno-rapid kit (diagnostic WAMA, SP, Brazil). It employs the “sandwich principle” for qualitative determination of specific antibody, where it uses colloidal gold-labeled virus surface antigen in human whole blood, serum or plasma samples.[7]

This step was performed by the researcher herself and previously trained collaborators. All biosafety measures were used during blood sample collection and proper disposal of the kit after use. Thus, disposable procedure gloves, cotton and 70% alcohol were used for antisepsis of the puncture site. Safety disposable sterile lancets were discarded after use in sharps collection boxes.

The reading of the sample result was performed between 15 and 20 minutes, according to the quick test kit manufacturer's guidelines. To interpret the results, it was considered negative when only one colored band (pink) appeared in the control area and positive when two colored bands (pink) appeared, one in the test area and the other in the control area. Also, the result was considered invalid when no visible color band appeared in the areas and in these cases the analysis was again performed.[7]

Then, the test result was returned to the individual participants, as well as the relevant guidelines. It was emphasized that because it is a rapid test there are chances of false negative and false positive results. In cases of negative results, participants were advised to perform a complementary laboratory test and seek a health unit to perform a new vaccination scheme, aiming to ensure protection before the start of theoretical-practical academic activities in health services.

Subsequently, a copy of the student's vaccination card was delivered at the time of enrollment. Thus, we investigated the HBV vaccine schedule, how many doses were recorded and the dates of them.

After collection, the information was transferred to a database, Microsoft Excel (version 2013) by double entry (typing). After database validation, coding for each of the discrete and continuous quantitative variables

was performed using the Statistical Package for the Social Sciences (SPSS) version 20.0.

Descriptive analysis of the data was performed, based on frequency and percentage calculations for discrete variables and calculations of means, medians, minimum, maximum and standard deviation for numerical variables. After the chi-square test was used to verify association between the variables, adopting a significance level of 5%.

In addition, the research followed the terms of Resolution No. 466/2012 and was authorized by the Research Ethics Committee of the institution, under protocol number CAAE 56447316.2.0000.5393.

RESULTS

Of the 102 students included in the study, 92 (90.20%) students were female, 64 (62.75%) came from the Bachelor of Nursing course and 38 (37.25%) from the Bachelor nursing diploma program. Nursing. Participants' ages ranged from 18 to 48 years, with a median of 19 years and a mean of 19.48 years.

We analyzed 102 copies of vaccination cards, from which it was observed that 94 (92.16%) participants received 3 doses of HBV vaccine, followed by 05 (4.90%) who received 1 dose, and 03 (2.94%) who did not have any dose. Regarding the period in which participants were vaccinated, it was observed that 93 (91.18%) of them received the vaccine before entering higher education. From this we can analyze that 89 (87.3%) had a complete vaccination schedule.

Regarding the means of obtaining vaccines, 82 (80.4%) students were vaccinated in the public service, followed by 20 (19.6%) vaccinated in both the public and private sectors. Regarding their experience in the field of nursing, 34 (33.3%) answered that they had already worked before entering college.

Participants were asked if they have ever had an accident with shared sharps and 24 (23.5%) reported having had an accident, and among the materials mentioned, there was a higher prevalence of pliers, razor and needle.

Participants' knowledge of the risks of hepatitis B virus infection during the academic activities of the undergraduate nursing course was evaluated. It is highlighted that 12 (11.7%) university students said they did not understand the importance of vaccination.

The data revealed that among the 89 college students who received the complete vaccination schedule, 42 (47.2%) college students had no protection against hepatitis B virus infection (p = 0.07). They were associated with the complete scheme being male (p = 0.01) and not having delayed doses (p = 0.04) (Table 1).

Table 1 - Bivariate analysis of factors associated with vaccine completeness among college students. Ribeirão Preto, Brasil.

	Complete vacinal scheme						
Variables	Yes		No		Total		p-value*
	n	(%)	n	(%)	n	(%)	

Sex							**0.011**
Male	84	94.4	8	66.7	92	90.2	
Female	5	5.6	5	33.3	10	9.8	
Color/race							0.142
White	67	75.3	6	58.3	73	73.3	
Black	6	6.7	0	0.0	6	5.9	
Brown/mixed	15	16.9	5	41.7	20	19.8	
Yellow/asian	1	1.1	0	0.0	1	1.0	
Updated vaccine card before college entrance exam?							0.422
Yes	50	56.8	7	53.8	57	56.4	
No	38	43.2	6	46.2	44	43.6	
Updated the vaccine card before enrolling at University?							0.555
Yes	56	63.6	9	69.2	65	64.4	
No	32	36.4	4	30.8	36	35.6	
Updated the vaccine card after enrolling at University?							0.301
Yes	21	24.4	5	41.7	26	26.5	
No	65	75.6	7	58.3	72	73.5	
Do you know the risks?							0.392
Yes	79	89.8	11	84.6	90	89.1	
No	9	10.2	2	15.4	11	10.9	
Do you recognize the importance of vaccination?							0.459
Yes	83	93.3	13	100.0	96	94.1	
No	6	6.7	0	0.0	6	5.9	
Do you have late doses?							**0.037**
Yes	1	1.1	2	15.4	3	2.9	
No	88	98.9	11	84.6	98	97.1	
Had contact with a Nurse previously?							0.627
Yes	30	33.7	4	30.8	34	33.3	
No	59	66.3	9	69.2	68	66.7	
Had a needlestick accident ?							0.119
Yes	19	21.3	5	38.5	24	23.5	

No	70	78.7	8	61.5	78	76.5	
Soroconversion							0.07
Yes	47	52.8	6	46.2	53	52.0	
No	42	47.2	7	53.8	49	48.0	

Moreover, the 13 (12.7%) undergraduates who did not have a complete vaccination schedule also did not have protective antibodies. Thus, the total number of students entering nursing undergraduate courses (Table 1) vulnerable to the acquisition of hepatitis B virus infection during professional training activities corresponded to 50.39%.

DISCUSSION

This study aimed to identify the vaccination status and hepatitis B vaccine protection among undergraduate nursing students before the start of theoretical and practical academic activities in health services. Although the number of participants involved is small, information from 102 students from the 130 students enrolled (78.5%) provided pertinent data to be discussed on the subject.

In the sample there was a predominance of females among the participants, which corroborates other studes.[8] From this perspective, the fact that nursing is a profession with a larger number of women may be due to its historical context as care practices have always been linked to the female figure. In fact, the matriarchal figure was considered the first nurse of the family in antiquity, and although the man has gained space within this profession, there is still resistance to his presence in some types of practices performed.

Although our results indicate that most students submitted a copy of their vaccination cards at the time of enrollment in these courses, not all new entrants had complete immunization against HBV. This situation has also been observed in other studies, and shows the health and safety risk of students of health courses when they start their practical academic activities in the services.[9] The presentation of this type of supporting document updated in the process of enrollment in Higher Education Institution (HEI), constitutes an important strategy of care and prevention of occupational risks among students, with the possibility of detecting failures in individual vaccination.[10]

Results show that the percentage of incoming students who received the complete vaccination scheme is in accordance with the literature.[11] These data can be derived from the awareness of students and health professionals about biosafety measures in undergraduate curricula, from the 1990s onwards.

However, the results reveal the lack of knowledge about the risks of HBV infection during the undergraduate nursing academic activities, and about the importance of vaccination as a prophylactic measure.[12] Misinformation, wrong/insufficient/pseudoscientific information, myths, temporal relationship to adverse events, lack of memory of the severity of previous epidemics, lack of credibility in vaccine

companies and/or health agencies, religious and philosophical ideologies can interfere with decision making of vaccination.

The vaccine decision can also be influenced by the breadth and ease of access to social media that has promoted huge amounts of information, not always correct, about the safety (or insecurity) of vaccines, their effectiveness, effectiveness, risks, etc. Furthermore, the lack of interest of health students in applying such a major prophylactic measure as HBV vaccine has been analyzed and many studies[5,8] point to the fear of adverse events as a cause of vaccine refusal in the general population and among health professionals. On the other hand, the fear of acquiring the disease during the epidemic period was also analyzed and revealed increased adherence to influenza vaccination among academics.

Hepatitis B is the most relevant infectious occupational disease for health workers.[13] This is because very small amounts of blood are sufficient for HBV transmission, and transmission through the splashing of blood to the ocular mucosa and percutaneous or mucous exposures to the blood of infected individuals is possible.

Vaccinations are the most effective prophylactic measure and their seroconversion can be conferred within two months of the three doses of hepatitis B vaccine by detecting anti-HBs protective titers, providing protection greater than 90%.

In the present study, 42.55% of students with complete immunization schedule did not develop seroconversion. This data reveals that a large group of vaccinated students are vulnerable to HBV infection. Similar data were obtained in another study that revealed low seroconversion to hepatitis B vaccine in nurses, indicating the need for revaccination of a significant portion of nurses.[14] Some factors have been reported to affect vaccine response, such as vaccine retention, application site, gender, age, obesity, smoking, chronic diseases, nutritional and immunological conditions, and genetic factors linked to human leukocyte antigen (HLA).[15]

The vaccination of health professionals is recognized as the best form of protection against infectious risk, however the evaluation of seroconversion is necessary to prove its effectiveness. In Brazil, it is recommended that anti-HBs serological testing be performed in healthcare professionals between one and two months after completing the three doses of HBV vaccine to verify the vaccine response, however, the test is not yet available for free in public services.[14,15]

In the academic context, the review of the responsibility of HEI regarding clarifications and actions directed to safety issues involving students during instructional practice, with emphasis on vaccination, has been analyzed.[16,17]

A limitation of this study is the sample size and for this reason it is not possible to generalize the findings, but for the group studied we showed that academics who are starting undergraduate nursing courses, despite having received the full HBV vaccine, are vulnerable to acquiring the disease infection because they did not develop the protective immunology response. These results reveal the need for intervention of the Higher Education

Institution in the orientation of its students of health courses to observe the need for vaccination and to perform serological tests to detect seroconversion and effective protection.

CONCLUSION

This study reveals the vulnerability of undergraduate nursing students to acquire hepatitis B virus infection during their professional training activities, showing that nursing professionals may be at occupational risk even during their training process. The results of this research may alert Higher Education Institutions about the protection and safety measures of students from various health courses, before starting their practical academic activities. It is considered relevant the implementation of educational actions from higher education institutions to educate and raise awareness about the importance of the complete vaccination scheme and certification of seroconversion as prophylactic measures of hepatitis B virus infection.

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COLLABORATIONS

APMF: substantial contributions in the conception of RESEARCH; in the writing of the article or its critical review; and in the final version to be published. IRACS, LCN and AVS: Substantial contributions to data collection, analysis and interpretation. MVFF: Substantial contributions to the writing of the article or its critical review. AAFLNQ: substantial contributions to the writing of the article or its critical

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CONFLICT OF INTERESTS

No conflicts of interest to declare.

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