ABSTRACT

Objective: Identifying the immune response to hepatitis B vaccine in crowded nurses in the intensive care units of a general hospital. Methodology: an experimental study of a quantitative approach performed in the intensive care units of a General Hospital in Teresina-PI, with 14 nurses, using the microparticles enzyme immunoassay. The study had the project approved by the Research Ethics Committee, CAAE 18110614.1.0000.5214. Results: there was a predominance of larger anti-HBs titles or equal to 100 mIU/ml. Accordingly, only 46.42% showed levels greater than or equal to 100 mIU/ml after immunization, 26.9% reached levels between 10 mIU/ml to 100 mIU/ml and in 19.5% of cases, these levels did not reach 10mIU/ml. Conclusion: it was found that the immune response to hepatitis vaccine in nurses crowded in both the intensive care units of the Hospital indicates the need for revaccination of a significant portion of nurses.

Descriptors: ICU; Nursing; Vaccination; Hepatitis B.

RESUMO

Objetivo: identificar a resposta imunitária à vacina contra hepatite B em enfermeiros lotados nas unidades de terapia intensiva de um hospital geral. Metodologia: estudo experimental de abordagem quantitativa realizado nas unidades de terapia intensiva de um Hospital Geral de Teresina-PI, com 14 enfermeiros, utilizando-se o imunoensaio enzimático de micropartículas. O estudo teve o projeto aprovado pelo Comitê de Ética em Pesquisa, CAAE 18110614.1.0000.5214. Resultados: houve predomínio de títulos de anti-HBs maiores ou iguais a 100 mUI/ml. Nestas, apenas 46,42% mostraram níveis maiores ou iguais a 100 mUI/ml após vacinação, 26,9 % atingiram níveis entre 10 mUI/ml e 100 mUI/ml e em 19,5% dos casos, esses níveis não atingiram 10mUI/ml. Conclusão: foi identificado que a resposta imunitária à vacina contra hepatite nos enfermeiros lotados nas duas unidades de terapia intensiva do Hospital indica a necessidade de revacinação de parcela significativa de enfermeiros.

Descriptors: UTI; Enfermagem; Vacinação; Hepatite B.
HBV to others through sexual intercourse. In view of this, the objective is to:

- Identifying the immune response to hepatitis B vaccine in crowded nurses in the intensive care unit of a general hospital.

**METHOD**

This is an experimental study of a quantitative approach performed in the ICU of a general hospital and teaching, large, reference in the North and Northeast, located in Teresina/PI, which serves the medical and surgical adult patients. The study population consisted of 20 nurses crowded this unit, and the sample defined by simple random sampling process, resulting in \( n = 14 \). Study participants were nurses who worked in the service in shifts, day and night and who had received three doses of hepatitis B vaccine, proven in the vaccination card.

To obtain the data for measuring the vaccine response there was used serologic tests for the quantitative determination of anti-HBs accomplished by enzyme immunoassay method of antibody microparticles in a state government laboratory. There were considered non-immunized nurses to results of serum levels <10 mIU/ml, seroconverted values between 10 and 99 mIU/ml and seroprotection with count> 100 mIU/ml.

The nurses were asked if they had received the vaccine against HBV prior to the survey and, if vaccinated, the vaccination schedule was done as recommended by the Ministry of Health. We excluded all individuals who did not receive previous vaccine, or there were not completed the vaccination schedule of three doses. The data obtained were processed statistically using the SPSS software (version 18.0).

The ethical aspects were followed according to Resolution No. 466/12 of the National Health Council (CNS), ensuring confidentiality, privacy, and non-use of information to the detriment of themselves. All participants signed a free and informed consent form (ICF). The research started after the approval of the research project by the Research Ethics Committee (CEP), with CAAE: 18110614.1.0000.5214.

**RESULTS**

The results include the characterization of the participants and presentation of the most relevant information in tables and graphs. Of the total of 14 participants there was a predominance of female nurses 13 (92.85%); in terms of age most were over 40. Of these 9 individuals whose age was between 20 and 59 years, 70% are women.
(64.3%) had more than eleven years of work at the institution.

Table 1. Distribution among nurses of intensive care units according to the characterization and their identifications. Teresina (PI), Brazil, 2014.

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%)</th>
</tr>
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<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>13 (92.85)</td>
</tr>
<tr>
<td>Male</td>
<td>1 (7.19)</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>30-40</td>
<td>3 (21.42)</td>
</tr>
<tr>
<td>41-50</td>
<td>10 (71.42)</td>
</tr>
<tr>
<td>51-70</td>
<td>1 (7.14)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>10 (71.42)</td>
</tr>
<tr>
<td>Single</td>
<td>4 (28.57)</td>
</tr>
<tr>
<td>Time of training (years)</td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>6-10</td>
<td>3 (21.48)</td>
</tr>
<tr>
<td>11-15</td>
<td>9 (64.3%)</td>
</tr>
</tbody>
</table>

Figure 1 shows the high portion of nurses (50%) with lower anti-HBs antibody rates and is therefore considered only seroconverted, these 3 (21%) were classified as non-immunized. There was a predominance of larger anti-HBs titles or equal to 100 mIU/ml in female participants.

Accordingly, only 6 (46.1%) showed levels greater than or equal to 100 mIU/ml after vaccination, 4 (30.1%) reached a level of 10 mIU/ml to 100 mIU/ml and 3 (23.08%) cases these levels have not reached 10mUI/ml.

![Figure 1. Distribution of nurses of ICU according to result of serology for anti-HBs. Hospital Getúlio Vargas. Teresina (PI), Brazil, 2014. (n = 14)](image)

Table 2 shows that 10 (71.4%) of the nurses had some risk factor related to the reduction of seroprotection for anti-HBV vaccine. Among those reporting make daily use of cigarettes, 3 (30%) had anti-HBs levels below 10 mIU/mL 3 (30%) of 10 mIU/ml to 100 mIU/ml and 4 (40%) levels greater than or equal to 100 mIU/ml. In non-smokers, rates of titers greater than or equal to 100 mIU/ml was 70.9% more evident.

With regard to age, 7 (78%) of individuals who were in the range of 30 to 49 had higher anti-HBs levels or equal to 100 mIU/ml, compared with participants aged 50-59 in that this rate was 32.2% (1).
Hepatitis B is the most important occupational infectious disease with regard to health workers. This is because very small quantities of blood are sufficient for HBV transmission, and transmission can occur through mucosal blood splash eye and biting; however, percutaneous exposures or mucosa to the blood of individuals infected with HBV are the major forms of transmission. Physiological characteristics make it highly resistant virus can survive for more than a week at room temperature in dried blood and is resistant to common detergents and alcohol.10-11

The high prevalence of female professional nurses is related to the fact that the nursing staff is mostly made up of professionals of this genre. A study conducted with 289 dentists and 104 auxiliary points Ratio of knowledge and professional skills and high chance of accidents. However, this finding is not justified by the fact that 46.4% reported having graduate in the intensive care area, which allows us to infer a greater aggregation of knowledge on the subject.11-12

Nurses and the nursing staff, in carrying out their daily activities need to perform procedures such as the introduction of peripheral intravascular devices that require greater physical proximity to the customer, for the development of care, which makes them exposed to various factors causing risks of industrial accidents. To this is added, the work environment that expose the higher risks of occupational accidents occur, such as ICUs.11-12 It is worth noting, service overload that can result in physical fatigue, also associated with double shifts, emotional disturbances, lack of service organization, use of new and unknown technologies among other factors.12

ICUs are considered critical air where there is usually a predominance of occurrences of accidents involving exposure to cutting punch material. The high rates are related to the types of assisted customers in these units, the dynamics of sectors in addition to quantitative professionals and procedures performed involve greater complexity and technical ability and handling when compared to other hospitals.12-13

Hepatitis B vaccine acts by inducing the production of anti-HBs by the immune system at titers greater than 10 mIU/ml reagents considered in more than 90% of adults. In Brazil, it is recommended that health professionals perform anti-HBs serum test between one to two months after completing three doses of HBV vaccine to check the vaccine response in spite of this, the test is not available for free services, which hampers the realization of the same, since that requires proper professional I cost testing.14-15

In this study, it was observed that a high percentage of nurses despite having strictly followed the vaccination schedule indicated by the Ministry of Health with 3 doses4 showed low antibody rates anti-HBs and is therefore classified as seroconverted, as only those with titles 100% are considered immunoprotected.

Additionally, the rate of 21% of nurses considered not immunized requires the need for revaccination and monitoring of these professionals who do not develop adequate levels of antibodies (anti-HBs > 10mIU/ml). These nurses, the primary vaccination course should be supplemented with a second series of three doses of hepatitis B vaccine, or if necessary, should be evaluated to determine whether they are carriers of HBV.8-9

The antibody response rate among adolescents and adults after the second dose of vaccine reaches 80%, and after the third dose can reach 95%; however, there are several factors that can interfere with seroconversion, such as inadequate care with the vaccine, the cold chain, age over 40, male gender, smoking, obesity and immune deficiency decreases the immunogenicity of the vaccine.5,11

Study about serological turning in health professionals reported association between non-smoking and a higher percentage of seroconversion, while studies using the same methodology showed that smokers after the vaccine had significantly lower immune response than non-smokers. In addition, two studies focus the cigarette among the factors
that interfere negatively in the serological response to vaccination.\textsuperscript{15-16}

A study also identified a significant relationship between the variables age/gender, listing them as factors for a more effective immune response; however, this association was not the subject of this study, furthermore, the fact that the vast majority of participants are women this showed up unviable.\textsuperscript{13} Even some people not having protective levels of anti-HBs p, they must provide immunological memory, demanding that this issue be continuously object of study, to allow greater inferences.

\textbf{CONCLUSION}

It was identified that the immune response to hepatitis A vaccine in nurses crowded in both the intensive care unit of Hospital study setting indicates the need for revaccination of a significant portion of nurses. Predominated higher anti-HBs titers equal to or 100 mIU/ml; however, only 46,42% had levels greater than or equal to 100 mIU/ml after vaccination and significant proportion (19,5%) of cases these levels have not reached 10 mIU/ml.

The portion of nurses who have had an accident involving sharps in the ICU was also high, and most of these (74%) had at least one risk factor that is related to the reduction of seroprotection for anti-HBV vaccine.

This reality suggests the need for greater intervention by the Continuing Education Center (NUCAP) Internal Commission for Accident Prevention (CIPA), Hospital Infection Control Commission (CCHII) and others, in an attempt to inform and train professionals ICU on the need for seroconversion test. Based on these results, it is expected that the hospital maintains a prevention program that favors not only vaccination against Hepatitis B, as well as the monitoring of vaccine response. There must be revaccination of immunocompetent nurses as identified by this study, eradicating the possibility of HBV infection.

\textbf{REFERENCES}


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