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ACCIDENTAL EXPOSURES TO BIOLOGICAL PRODUCTS – A RISK FOR MEDICAL STAFF AND PATIENTS[1]

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ABSTRACT. Hypothesis: While performing professional activities, the healthcare workers (HCW) can be exposed to blood and other potentially infectious materials from the patients they are taking care of. In order to minimize the risk of Hepatitis B virus (HBV), Hepatitis C virus (HCV) and human immunodeficiency virus (HIV) transmission, these accidental exposures should be reported and followed by post-exposure prophylaxis. If seroconversion of the injured person occurs, the healthcare unit intervenes by various methods to ensure that the infected HCW does not represent a source of infection for other patients [1]. **Objective:** Through this study we aimed to assess the perception of different categories of healthcare personnel about their testing for their carrying of HBV, HCV and HIV at the time of employment in a healthcare facility and their right to confidentiality regarding their health status. We also wanted to evaluate the opinion of the medical staff about the patient's right to be informed about the risk of HBV, HCV and HIV transmission, if there is an infected person in the medical team. **Method:** A multicentric cross-sectional study was performed, by applying an original pre-tested questionnaire to different professional categories of medical staff from different categories of healthcare facilities. **Results:** Over 20% of respondents declared they were not tested at the time of employment, but almost 40% claimed that they were tested every year since employment. Only 20% of the participants considered they have the right to confidentiality regarding the state of viral carrying, but ⅓ consider that there is no discrimination if a healthcare facility refuses to hire a HBV, HCV, HIV carrier. Out of all participants

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1 This study is part of the PhD thesis entitled "Study on the assessment of the main risk factors for incidents due to exposure to biological products in the health domain".

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questioned, ½ of the respondents agree that the medical staffs who are a carrier for a transmissible virus can be detached in a less dangerous healthcare department in order to avoid the transmission of the virus to patients. Almost equally, there were participants who believed that they could not be compelled to reveal their carrier status to the patient, and those who would have no hesitation in informing their patient about their status

Keywords: *Blood and other potentially infectious materials, exposure, healthcare workers, patient, confidentiality.*

REZUMAT. ***Expuneri accidentale la produsele biologice – un risc pentru personalul medical şi pentru pacienţi.*** **Ipoteză:** Personalul medico-sanitar (PMS) în timpul prestării activităţii profesionale este expus sângelui şi altor produse biologice provenite de la pacienţii asistaţi. Aceste expuneri sau accidente ar trebui raportate cu scopul aplicării unor măsuri de profilaxie postexpunere, pentru minimalizarea riscului transmiterii virusului hepatitei B şi C şi a virusului imunodeficienţei umane. Dacă totuşi se produce seroconversia persoanei accidentate, unitatea sanitară trebuie să intervină prin diferite metode pentru a se asigura, că personalul medico-sanitar infectat nu devine sursă de infecţie pentru alţi pacienţi îngrijiţi [1]. **Obiectiv:** Prin acest studiu ne-am propus evaluarea percepţiei diferitelor categorii de personal medico-sanitar despre testarea lor cu privire la portajul de virus hepatitic B (VHB), virus hepatitic C (VHC) şi virusul imunodeficienţei umane (HIV) în momentul angajării într-o unitate sanitară, dar şi despre dreptul lor la confidenţialitate cu privire la starea lor de sănătate. Am dorit să evaluăm şi părerea personalului medico-sanitar despre dreptul pacientului de a fi informat asupra riscului de transmitere a VHB, VHC sau HIV, dacă în echipa medico-sanitară există persoană infectată. **Metodă:** A fost efectuat un studiu transversal multicentric, prin aplicarea unui chestionar original pretestat la diferite categorii profesionale de personal medico-sanitar din diferite categorii de unităţi sanitare. **Rezultate:** Peste 20% din respondenţi au declarat că nu au fost testaţi la angajare, în schimb aproape 40% au susţinut că au fost testaţi chiar anual de când sunt angajaţi. Doar 20% dintre subiecţi au considerat că au dreptul la confidenţialitate privind starea lor de portaj viral, dar ⅓ nu cred că este discriminare, dacă o unitate sanitară refuză angajarea unei persoane cu portaj VHB, VHC sau HIV şi ½ din persoanele chestionate sunt de acord că personalul medico-sanitar purtător poate să fie mutat în sector mai puţin periculos din punct de vedere al transmiterii spre alte persoane. În pondere aproape egală au fost subiecţii care cred că nu pot fi obligaţi să-şi dezvăluie statului lor de purtător în faţa pacientului, şi cei care nu ar avea nici o reţinere în a-şi informa pacientul despre acest lucru.

Cuvinte cheie: *expunere la sânge şi produse biologice, personal medico-sanitar, pacient, confidenţialitate.*

Introduction

Accidental exposure to biological products is represented by any accidental exposure to blood and any other potentially infected material which may contain blood borne pathogens and involves damage to the skin (sting, cut), or splashing the mucous membranes or the damaged skin [2].

Healthcare workers' accidental exposure to biological products suggests a topic of great interest in all medical units, with or without beds, either public or private. This interest derives both from the frequency of these incidents and from their possible consequences on the health of the medical staff and indirectly on the health of the assisted patients.

A study was conducted between 2017-2018 on subjects of different professional categories from various types of health units, in order to collect information about the perception of HCW about the need to test them concerning the detection of HBV, HCV and HIV carrying. At the same time, they were able to express their agreement or disagreement about the right to confidentiality of the medical staff regarding their state of health at the time of employment in the health field or the right of the health unit to set conditions for hiring in relation to the candidate's health status.

They were also able to assert on the obligation of the carrier to inform their patients about this and the need for a clear legislation that determines exactly the rights and obligations of the employer, employees and patients in the event of the existence of HBV, HCV or HIV carriers among employees.

Method

The design of the study was multicenter cross sectional and included 541 participants representing HCW from different categories of public and private healthcare units and medical education units in Cluj County, Romania. An original pretested questionnaire was applied between October 2017 and June 2018 to different professional categories in these healthcare units. The questionnaire consisted of closed questions with single or multiple choices, the matrix question with single answer and open-ended questions.

The including criteria consisted in all the healthcare staff who perform healthcare activities having direct contact with the patient and/or with other potentially infectious materials and used medical devices in the selected units. The exclusion criteria were the administrative, technical and auxiliary staff that does not perform medical activity in the selected facilities.

The questionnaires were applied using paper printed materials, by the study leader or by a designated person from the cooperating health unit.

Data analysis was performed using statistical-mathematical methods (frequencies count, averages) using Excel 2010. The following variables were analyzed: testing of medical staff prior employment and periodically for HBV, HCV, HIV viral carrying, respondents' perception according to the right to confidentiality about their health status towards the employer and patients regarding a possible HBV infection, HCV and HIV.

Results

The participants to study were asked if they had been tested for HBV, HCV and HIV on employment. Almost 66% said that they had been asked for these tests and over 20% declared they had not been tested. (Figure 1)

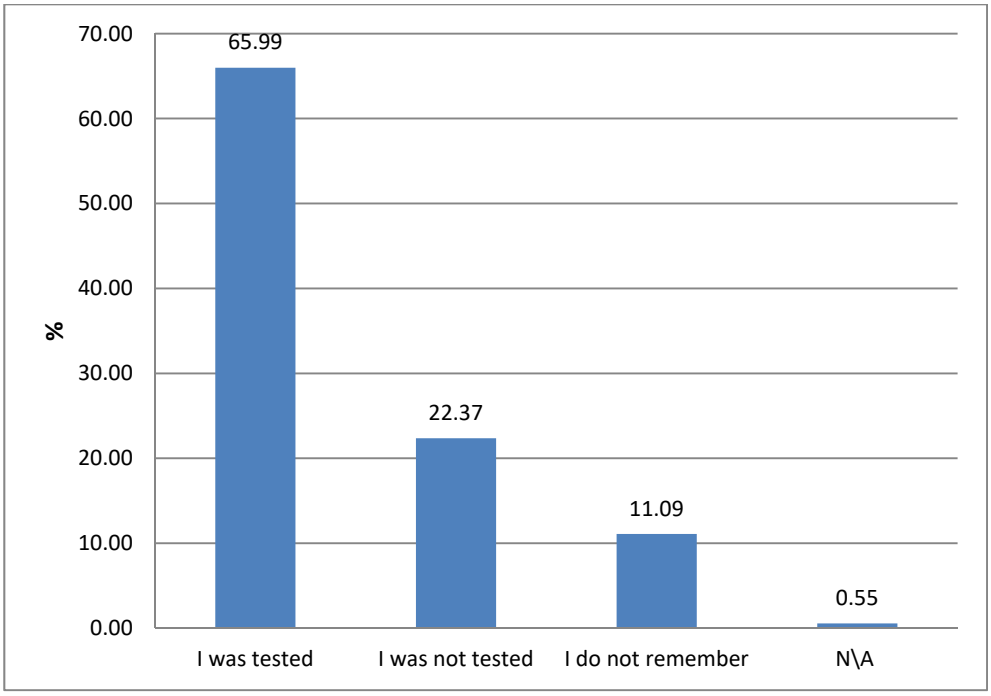

Figure 1. Percentage of tested medical staff prior employment for HBV, HCV and HIV carriers

The same participants claimed that after employment less than 40% were tested annually for HBV, HCV and HIV serology, about 10% were tested, but not every year and almost 37% were never tested again. (Figure 2)

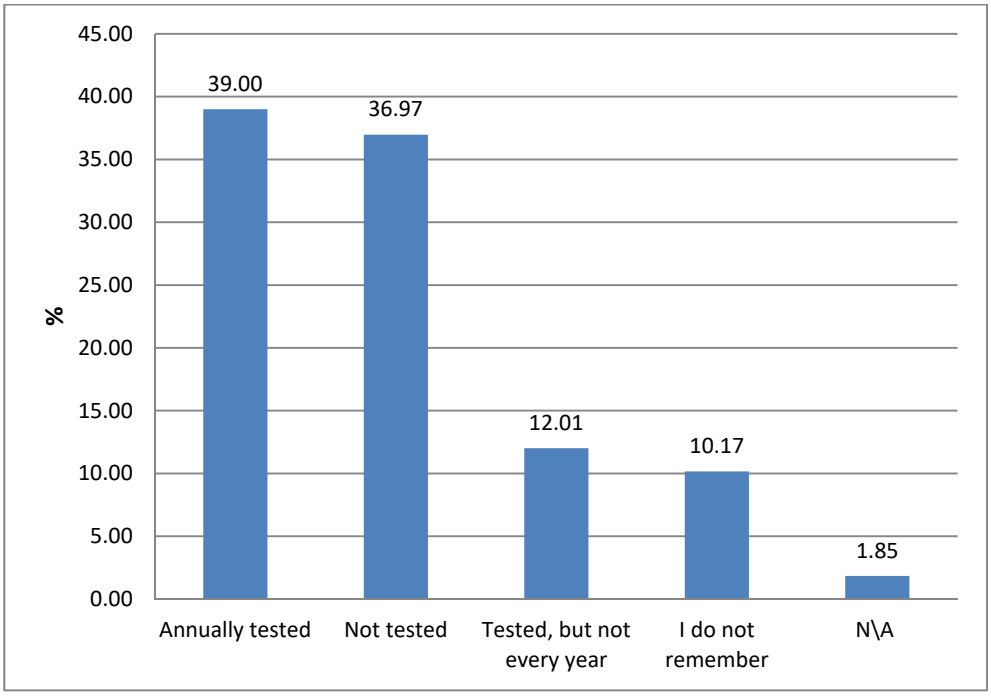

Figure 2. Periodical testing for HBV, HCV and HIV carrier status of medical staff after employment

Under ¼ of the subjects disclosed their total or partial agreement with the statement that the employer in the health sector should not know about the carrier status for HVB, HCV and HIV of the employee, all this information being confidential. Over 60% of the respondents, however, did not agree with the right to confidentiality of employees towards the employer. (Figure 3)

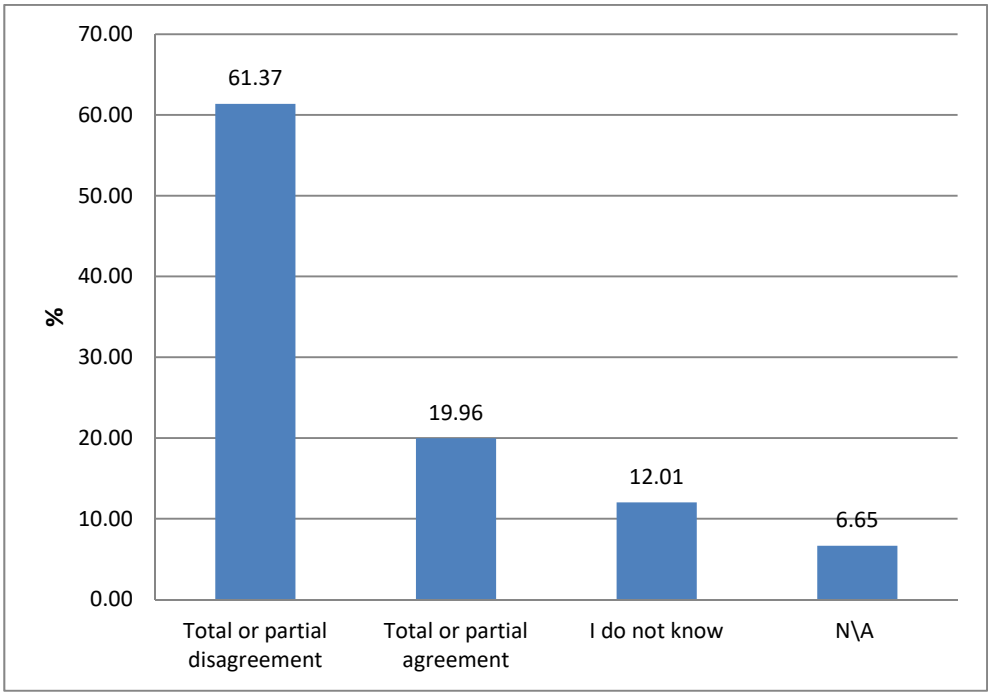

Figure 3. The employer in the healthcare sector should NOT know about the employee's carrier status for HVB, HVC, HIV, as these data are confidential

To the statement that the employer in the health sector does not have the right to condition the absence of hepatitis B or C virus and HIV, 43% of the respondents agreed that this attitude is discriminatory. However, ⅓ of the respondents consider that the health unit has the right to refuse the employment of a hepatitis B or C virus and HIV carrier and these selection criteria is not discriminatory. (Figure 4) According to ½ of the respondents, however, the employer has the right to remove the staff that has carrier status for hepatitis B or C virus and HIV from interventional medical activities, offering the HCW a safe position in terms of the possibility of transmitting the virus from staff to patient.

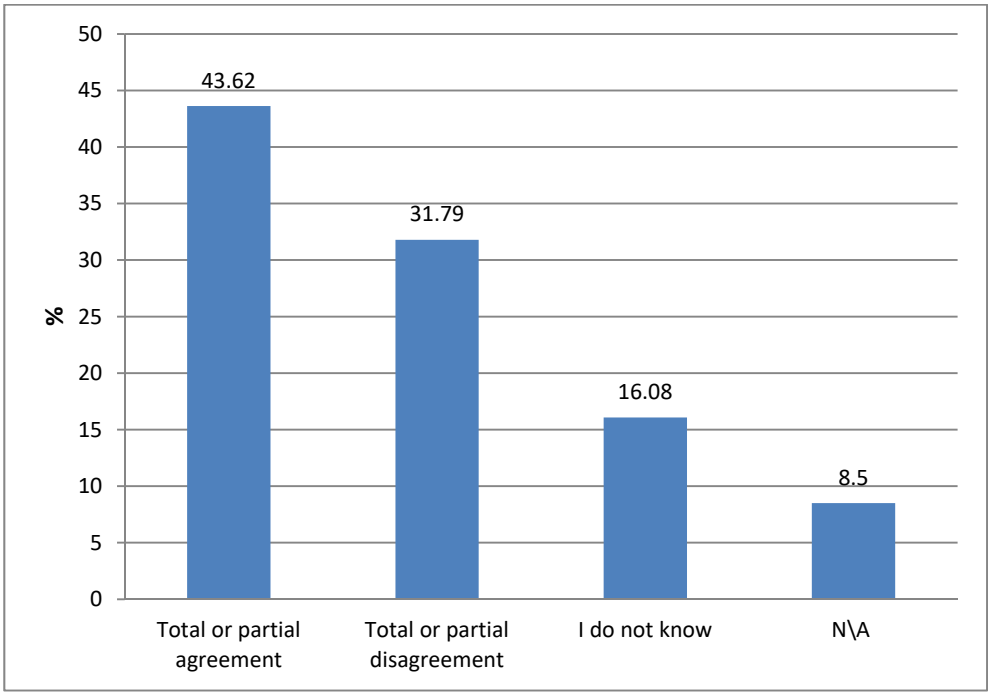

Figure 4. The employer in the health sector does NOT have the right to condition the employment by absence of hepatitis B or C virus and HIV, this attitude being discriminatory

Almost 40% of the medical totally or partially disagreed with the obligation to inform the patient about their HBV, HCV and HIV carrier status and the need to obtain the patient's written consent that they agree to receive medical care from HCW with carrier status. The same 40% totally or partially agreed that the patient should be generally informed about the possibility that there may be carriers of HBV, HCV or HIV in the medical team and the patient should sign a written consent that he or she agrees to be cared for by the team. However, a slightly lower percentage of 35% of respondents would agree to disclose to the patient their carrier status in order to obtain the patient's consent to be subsequently treated by the infected person. About ⅔ of the subjects consider that there is a need for a law regulating the rights and obligations of the employer staff and patients in the health domain concerning the HBV, HCV or HIV carrier status, given the risk of transmitting the virus from staff to patient during the medical care. (Figure 5)

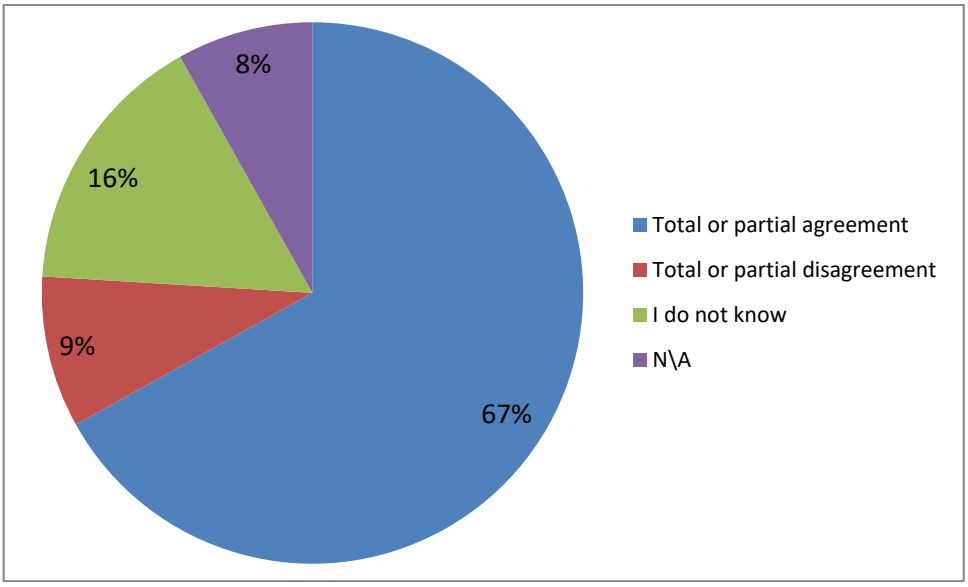

Figure 5. The need for clear legislation

Discussions

Out of all biological products, blood is the most important factor in transmitting hepatitis B or C and HIV. Different types of biological products may have a higher or lower load of pathogens, which determines the infectivity degree of the product, assuming that these products are not visibly contaminated with blood [2].

Worldwide, in 2000 alone, percutaneous exposures to biological products in healthcare professionals led to 66 000 hepatitis B cases, 16 000 cases of Hepatitis C and 1000 cases of HIV infection [3].

In a study conducted between 2004-2008 in South Korea, which is an endemic area for hepatitis C virus, HCV transmission was determined among healthcare professionals following percutaneous exposure to biological products. During the 5 years of study 1.516 accidents were registered, of which 327 (21.6%) were caused by HCV infected patients. Of those who were exposed to the HCV, 3 people had seroconversion, the transmission rate being very low (0.9%) [4].

Another prospective study which was published in 2000 estimated the transmission rate of blood-borne pathogens from infected patients to healthcare professionals. By percutaneous exposure to biological products, the average risk of HIV transmission was 0.3%, of HBV between 6-30% and of HCV of 1.8% [3].

The application of standard precautions is mandatory to prevent the transmission of hepatitis B and C viruses or HIV, but if blood accidental exposure has occurred, poste-exposure prophylaxis measures should be applied, which may significantly reduce the risk of seroconversion. The medical staff carrying the blood borne virus can become a possible source of infection for the patients they take care of.

Experts claim that the risk of transmission from healthcare professionals to assisted patients is extremely low in case of routine medical care, but increases considerably in invasive procedures.

According to a 15 year study in Germany, HCW infected with HBV and positive for HBeAg, have transmitted the virus on average to 4% of patients who underwent invasive interventions with a high risk of injury, but only to 1.5% of patients, is staff had undetectable HBeAg. In case of HCW infected with HCV, 0.15% of their patients acquired the virus during medical care [5].

A guide has been developed in Canada to prevent the transmission of viruses from infected HCW to patients through contaminated blood. They assessed that the risk of transmission from staff to patients is higher in HBV and lower in HIV [6].

Here, however, there are questions about the employee's right to confidentiality versus the employer's right to obtain information about the health of medical staff during the employment process and during collaboration, in order to assess the potential risk of transmitting these viruses from HCW to patients cared for, even if these medical examinations are carried out concordant with the enforcement law [7, 8]. In our study, based on the answers obtained from the participants, it appears that over 60% of them underwent serological tests on employment in a healthcare unit and 39% repeated these tests annually. Out of those who were surveyed, 20% believe that by requesting these tests for checking the carrier status for HVB, HCV and HIV at employment or annually, their right to privacy is disregarded, instead 60% of respondents agree that the healthcare employer should have access to this information. However, in the opinion of over 40% of respondents, the employer does not have the right to refuse to hire an HIV positive person, but can advise this person to perform medical activity in a department with less risky work in terms of transmitting viruses. A slightly lower percentage claimed that it would be no problem for them to inform their patients about their viral carrier status, in order to obtain the patient's consent to be treated by a person infected with HBV, HCV or HIV.

According to the relevant legislation, medical personnel who undergo an accidental exposure to biological products during performing medical activity, must report these events and follow the post exposure prophylaxis protocol [9,10], but other studies show that there is an underreporting if these events [11,12], one of the reasons may be the obligation for completing these post exposure tests for HBV, HCV and HIV.

Conclusions

There is a worldwide concern to ensure the safest possible working conditions for medical staff. However, accidents with exposure to biological products occur. These accidents frequently occur due to staff negligence or lack of employees training regarding the provisions of standard precautions. There is also the underreporting phenomena of these events either because the fear of repercussions, or because of the misconception about the risk of illness.

Although in Romania there is legislation that regulates the medical conditions at employment and the annual medical examinations performed by occupational medicine physicians, the medical staff is not very well informed about the rights and obligations they have at the time of employment and during the employment contract.

In Romania, there is a need for a very clear legislation that stipulates the attitude of the employer in the health field towards infected employees with HBV, HCV and HIV. However, it is a sensitive issue, if we balance the right to confidentiality of medical staff regarding their health, avoiding their discrimination in case of chronic communicable disease but also ensuring the patient's right to safe medical act.

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