



The Brazilian Journal of INFECTIOUS DISEASES

www.elsevier.com/locate/bjid



Original article

Prevalence of hepatitis B and C virus infections among military personnel



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ARTICLE INFO

Article history:

Received 28 December 2014

Accepted 13 February 2015

Available online 10 March 2015

Keywords:

Hepatitis B

Hepatitis C

Prevalence

Military personnel

ABSTRACT

Background: Data regarding Hepatitis B and C viruses (HBV and HCV) prevalence among military personnel in Brazil are lacking, but the work-related risk of exposure can be high. The objective of this study was to estimate the seroprevalence of HBV and HCV and the risk factors associated to HBV exposure among Brazilian military personnel.

Methods: A cross-sectional study was conducted and included 433 male military adults aged 18–25 years old working in Rio de Janeiro during October 2013. All individuals completed a questionnaire to assess their risk of exposure and provided a blood sample to HBV and HCV testing.

Results: None of the participants presented HBsAg or anti-HBc IgM, 18 (4.1%) were positive for total anti-HBc, 247 (57.0%) were positive for anti-HBs, and 3 (0.7%) were anti-HCV reactive. The majority of military personnel with past HBV infection (anti-HBc reactive) and HBV immunity (anti-HBs reactive) had a history of prior dental procedures (88.9% and 77.3%), consumption of alcohol at least once a week (50% and 55.9%), and practiced oral sex (61.1% and 58.3%, respectively). In addition, anti-HBc positivity was common among individuals with a history of surgery (44.4%) and practice of anal sex (50%). At univariate analysis, age group was associated to anti-HBc and anti-HBs positivity.

Conclusions: Low rates of HBV and HCV infection were observed among Brazilian military personnel in comparison to the general Brazilian population. HBV immunity rates were relatively low indicating the need for vaccination campaigns in this group.

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<http://dx.doi.org/10.1016/j.bjid.2015.02.002>

1413-8670/© 2015 Published by Elsevier Editora Ltda.

Introduction

Hepatitis B and C viruses (HBV and HCV) share parenteral route as a common mode of transmission. Worldwide, approximately 240 million people are chronically infected with HBV and 130–150 million with HCV.^{1,2} A population-based multicentric, epidemiological survey was conducted in the general population across the five geographic regions of Brazil and found an overall HBsAg seroprevalence rate of 0.37%, 7.4% of anti-HBc, and 1.38% of anti-HCV among individuals aged 10–69 years.^{3,4}

Prevalence studies of these blood-borne diseases showed certain risk groups and behaviors that should be considered as reasons for concern and taken into account when designing a more appropriate epidemiological investigation. In this context, anti-HBc reactivity has been reported to be 1.7% among health professionals, 5.9% among beauticians, and 12.8% among recyclable waste collectors.^{5–7} Anti-HCV seroprevalence has a narrower range: 0.2% among children, 1.3% among crack users, and 1.4% among truck drivers.^{8–10}

Young men are group in whom it is very important to recognize risk behaviors associated with parenterally transmitted diseases. Military personnel offer a reachable and often nationally representative sample for disease surveillance. In Brazil, military service is compulsory for one year for men aged 17–20 years from all social classes. Brazilian military personnel are being sent to countries that present high estimated prevalence rates for HBV and HCV infection, such as Colombia where HBV prevalence was 18.6%¹¹ and Haiti with HCV prevalence of 4.4%.¹² This group of individuals could be more exposed to transmissible infectious diseases due to their missions.^{13,14}

HBV immunization was included in the Brazilian vaccination schedule for newborns in 1996 and was also recommended to military personnel in 2010.¹⁵ In Brazil, the coverage of hepatitis B vaccination among children less than 18 months old varies from 80 to 95% according to socioeconomic status.¹⁶ Among young adult males in the Air Force in South Brazil, 84% of them reported a three-dose schedule of HBV vaccination while 66.9% of fire-fighters from Central Brazil had serum markers of HBV immunity.^{17,18} Thus, in face of the paucity of data regarding HBV and HCV markers of infection among military personnel in Brazil, this study was conducted to estimate the prevalence rates of HBV and HCV markers and risk factors in military personnel serving at a military unit in Rio de Janeiro City, in southeast Brazil.

Methods

Study population

This is a cross sectional, seroprevalence study and consisted of 433 military male personnel in the age range of 18–25 years old. All of them belonged to the largest military unit considered to be a central point for recruits and officers education in Rio de Janeiro State and one of the oldest units of Brazil. In this unit, approximately 1200 individuals are serving in the Military, the majority of them being conscripts.

In Brazil, military service is compulsory and young men have to draft for serving in the armed forces, most of them in the Army, when they turn 18, independent of level of education or socio-economic status. After concluding the recruitment process, those conscripts who were considered suitable by a selection commission begin basic military training at different military units. Those willing to pursue a military career will remain in service.

The recruitment for this study was began in October 2013 and all individuals serving at the aforementioned unit were invited to participate in the study soon after their arrival to that military unit. Study participants were male, aging 18 years or more, and registered in the military service. Those not consenting to participate were excluded.

Questionnaire

A standard questionnaire was submitted to the study subjects by the team of this study before blood collection. The questionnaire inquired about socio-demographic characteristics of the individuals (age, gender, educational status, income level, history of previous hepatitis) and risk factors for hepatitis B and C [history of blood transfusion or blood products, surgery, intravenous drug use, haemodialysis, dental procedures, acupuncture, tattooing, piercing, alcohol consumption at least once per week, sexually transmitted diseases (STDs), sexual orientation, number of sexual partners, condom usage, practice of oral and/or anal intercourse, exposure to manicure/pedicure who used non-sterilized instruments, and sharing personal care items such as toothbrushes, razors/blades, nail clippers or scissors].

Information on HBV vaccination (vaccination status and number of doses received) was collected through a self-report method since vaccination cards or medical charts were not available for consultation at the time of enrolment into the study.

Blood sampling for detection serological markers of viral hepatitis

A blood sample (5 mL) was taken from each subject by venipuncture using a vacutainer device. The sample was allowed to clot for serum recovery and stored at -20°C until analysis.

Serum samples were tested for HBsAg, anti-HBc IgM, total anti-HBc, anti-HBs, and anti-HCV using commercial enzyme-immunoassay (ELISA) kits (Diasorin, Italy), according to the manufacturer's instructions. Samples found to be negative on the preliminary screening were considered seronegative and samples initially tested borderline or positive were retested using the same assay in order to confirm these results.

Data collection and analysis

The prevalence rates of HBV and HCV markers were calculated for the total study population. Continuous variables were reported as the mean \pm standard deviation. Descriptive statistics were generated for the responses, and the chi-squared test (χ^2) for independence or for trend was used to assess the association of categorical variables and anti-HBc and

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