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Vaccination coverage in a cohort of HIV-infected patients receiving care at an AIDS outpatient clinic in Espírito Santo, Brazil

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ABSTRACT

This cross-sectional study assessed the immunization status of human immune deficiency virus (HIV)-infected patients receiving care at an outpatient clinic in Brazil. The sociodemographic characteristics, CD4 count and HIV viral load of 281 out of 612 adult outpatients were analyzed. A total of 331 patients were excluded because of no availability of vaccination cards. Chi-square or Fisher's exact test were used. Immunization coverage was higher for diphtheria/tetanus (59.79%) and hepatitis B (56.7%), and lowest for hepatitis A (6.8%) and for meningococcal group C (6%). Only 11.74% of the patients had received the influenza virus vaccine yearly since their HIV-infection diagnosis. No vaccination against influenza ($p < 0.034$) or hepatitis B ($p < 0.029$) were associated with CD4 counts <500 cells/mL; no vaccination against flu or pneumococcus were associated with detectable HIV viral load ($p < 0.049$ and $p < 0.002$, respectively). Immunization coverage is still very low among HIV-infected adults in this setting despite recommendations and high infection-related mortality.

Introduction

The new potent therapies introduced in mid-1990s significantly reduced Acquired Immunodeficiency Syndrome (AIDS)-related mortality. Brazil was a pioneer in implementing universal access to modern antiretroviral therapy within the country's public healthcare system. In 2014, more than 400,000 individuals were estimated to be on these drugs.[1] Nevertheless, likely due to late diagnosis (26% of patients were still initiating treatment with a CD4T lymphocyte count below 200 cells/mL in October 2014)[1] or because of patients' difficulty in complying with treatment, many deaths from AIDS were still reported in this setting. The latest epidemiological bulletin published by the Ministry of Health reported that mortality resulting from AIDS declined by only 6% in Brazil over the past ten years, falling from 6.1 deaths per 100,000 inhabitants in 2004 to 5.7 per 100,000 in 2013.[1]

The main cause of mortality in HIV-infected patients between 2009 and 2013 in the Brazilian state of Espírito Santo were infectious and parasitic diseases.[2]

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The National Immunization Program has specific recommendations for HIV-infected patients.[3] These recommendations are also emphasized by the National AIDS Program, in its clinical protocol and therapeutic guidelines for the management of HIV infection in adults.[4] Nevertheless, there has been no assessment of the effective implementation of these immunization protocols in the daily routine of services dedicated to the care of AIDS patients in Brazil.

The main objective of the present study was to assess immunization coverage in a referral center for HIV-infected patients in accordance with the recommendations published by the Ministry of Health.

Materials and methods

A cross-sectional, observational study was conducted to assess the immunization status of HIV-infected individuals receiving care at an infectious diseases outpatient clinic in a large philanthropic hospital. The study was conducted between January 2015 and February 2016.

The sample size was calculated taking into account the proportion of individuals immunized against various different diseases to be evaluated. Considering the population of approximately 1000 HIV-infected patients being followed up at the referral center, for an expected prevalence of immunized individuals of 40%, a sample error of 5%, and significance level of 5%, the minimum required sample size was defined as 270 patients. Allowing for an exclusion rate of 50% (patients losing or forgetting to bring in their immunization record card), the minimum number of patients required to screen for admission to the study was established as 540. The sample consisted of HIV-infected individuals over 18 years of age who were selected randomly while consulting with physicians at the infectious diseases outpatient clinic.

The Institution internal review board approved the study protocol under reference CAAE 42811014.4.0000.5065. All the participants signed an informed consent form.

The patients' records were reviewed and a previously validated questionnaire was used to collect data on age, sex, mode of HIV transmission, antiretroviral drugs in use, date of the HIV-infection diagnosis, last CD4 cell count and HIV viral load, and hepatitis B surface antibody (anti-HBs) status.

The latest guidelines from the Ministry of Health indicate the following vaccines for HIV-infected patients: diphtheria/tetanus, pneumococcal, influenza, hepatitis B, hepatitis A, and meningococcal group C.[3] Patients were considered appropriately immunized if they had had four double doses of the hepatitis B vaccine, three doses of the diphtheria/tetanus vaccine (with the latest within 10 years), annual influenza vaccines from the date of HIV diagnosis until the date of the interview, two doses of the hepatitis A vaccine, two doses of the 23-valent polysaccharide pneumococcal vaccine, with a minimum interval of five years between the two doses (in the case of patients diagnosed more than five years previously), and two doses of the meningococcal group C conjugate vaccine. For analysis of the hepatitis B vaccine, the patient's status of hepatitis B surface antibody was checked to define their antibody status for the disease. The yellow fever vaccine was not included in this investigation, since yellow fever was not considered endemic in this state at the time this study was done. Other live attenuated vaccines (measles, mumps, rubella, and varicella), particularly recommended in the case of pediatric patients, albeit contingent on CD4 levels, were also not assessed, since children were not included in this study sample. For the same reason, immunization coverage with respect to the human papillomavirus (HPV) vaccine, which was introduced during the study period for females aged 9–26 years, was not a focus of this study.[5] Chi-square or Fisher's exact test (in the case of expected values < 5) was used to verify associations between categorical variables. The standardized residuals were analyzed and compared with a critical value of 1.96, and significance was established at 5%.

All the patients whose immunization was incomplete were referred to the Special Immunobiology Referral Center (CRIES) to rectify the situation.

Results

Initially, 612 patients were screened. Of these, 331 individuals failed to bring their vaccination cards to any of the consultations they attended during the study period despite being repeatedly requested to do so. These patients were excluded from the study and the final sample consisted of the remaining 281 patients, 58 of whom had no vaccination card because they had never been vaccinated.

Most of the patients were male (52.31%). The mode of HIV transmission was heterosexual exposure in 69.39% of cases. Only 2.5% of the patients had yet to commence treatment. Overall, 80.1% of the patients had an HIV-1 viral load below detectable limits (<50 copies/mL) and 63.3% had a CD4 lymphocyte count > 500 cells/mL (Table 1).

In this study sample, 223 patients (79.4%) had a vaccination card and presented it during one of the consultations. The best immunization coverage (59.79%) was against diphtheria/tetanus. Around 7.45% of the individuals had failed to complete the required immunization schedule for this vaccine and in 32.74% of cases this information was absent in their vaccination cards.

Of the patients assessed, 159 (56.7%) had received at least three doses of the hepatitis B vaccine, while 37.1% of these had received the regimen of four doses, as recommended for HIV-infected patients.[1] Vaccination was incomplete in 9.6% of cases and 33.8% of the patients had not been vaccinated at all against hepatitis B (Table 1). Only 50.17% of the participants had been tested for hepatitis B surface antibody (anti-HBs) previously. No statistically significant association was found between the number of doses received of the vaccine against hepatitis B and anti-HBs positivity.

Immunization against hepatitis A was complete in only 6.8% of the patients, while 76.9% had not received any dose of this vaccine. Only 11.74% of the study patients had received the annual influenza vaccine correctly ever since the date of their HIV diagnosis. On the other hand, 30.25% had never been vaccinated against influenza and 58% had not completed the full immunization calendar, with 56.93% of these individuals having received less than half of the recommended number of doses.