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Prevalence of Hiv/Tb Coinfection in Patients from a Referral Hospital in *Rio de Janeiro* City

Prevalência da Coinfecção Hiv/Tb em Pacientes de um Hospital de Referência na Cidade do Rio De Janeiro

Prevalencia de la Coinfección Vih/Tb en Pacientes de un Hospital de Referencia en la Ciudad del Río de Janeiro.

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ABSTRACT

Objective: The study's purpose has been to estimate the prevalence of HIV/TB coinfection in patients submitted to treatment of multidrug-resistant tuberculosis (MDR-TB) at a referral hospital in *Rio de Janeiro* city. **Methods:** It is a cross-sectional study that was carried out over the period from March to December 2016, whose population was composed of 40 patients undergoing treatment for MDR-TB. Statistical analysis was performed using the SPSS statistical program. **Results:** During the study time frame, 40 cases of MDR-TB were diagnosed, out of which 9 cases showed positive serology for HIV, representing a coinfection rate of 22.5%. In this group, the male gender predominated (85.29%) and with average age of 37.5 years old. The diagnosis of TB in coinfected patients occurred in the pulmonary clinical form (80%). In the smear test, (66.6%) presented a positive result, (74.9%) suggestive radiology and 100% of the patients presented resistance to rifampicin in the GeneXpert TB test. **Conclusion:** The drugs that presented the most resistance in this group were rifampicin, isoniazid and streptomycin (87.5%).

Descriptors: Coinfection, Tuberculosis, Epidemiology.

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RESUMO

Objetivo: Estimar a prevalência de coinfecção HIV/TB em pacientes submetidos a tratamento de TBMR em um hospital de referência do Rio de Janeiro. **Método:** Uma investigação transversal, cuja população foi composta por 40 pacientes em tratamento para TBMR, no período de março a dezembro de 2016. Para análise estatística utilizou-se o programa estatístico SPSS. **Resultados:** No período em estudo foram diagnosticados 40 casos de TBMR, dos quais 9 mostraram sorologia positiva para HIV, o que representou uma taxa de coinfecção de 22,5%. Nesse grupo predominou o sexo masculino (85,29%) e a média 37,5 anos. O diagnóstico de TB nos coinfectados prevaleceu a forma clínica pulmonar (80%). No teste do esfregaço, (66,6%) apresentaram resultado positivo, (74,9%) radiologia sugestiva e 100% dos pacientes apresentaram resistência a rifampicina no teste do Gene Xpert. **Conclusão:** As drogas que apresentaram-se mais resistentes neste grupo foram rifampicina, isoniazida e estreptomicina (87,5%).

Descritores: Coinfecção, Tuberculose, Epidemiologia.

RESUMEN

Objetivo: Estimar la prevalencia de coinfección VIH/TB en pacientes sometidos a tratamiento de TBMR en un hospital de referencia de Río de Janeiro. **Método:** Una investigación transversal, cuya población fue compuesta por 40 pacientes en tratamiento para TBMR, en el período de marzo a diciembre de 2016. Para análisis estadístico se utilizó el programa estadístico SPSS. **Resultados:** En el período en estudio se diagnosticaron 40 casos de TBMR, de los cuales 9 mostraron serología positiva para el VIH, lo que representó una tasa de coinfección del 22,5%. En ese grupo predominó el sexo masculino (85,29%) y la media 37,5 años. El diagnóstico de TB en los coinfectados prevaleció la forma clínica pulmonar (80%). En la prueba del frotis, (66,6%) presentaron un resultado positivo, (74,9%) radiología sugestiva y el 100% de los pacientes presentaron resistencia a rifampicina en la prueba del Gene Xpert. **Conclusión:** Las drogas que se presentaron más resistentes en este grupo fueron rifampicina, isoniazida y estreptomicina (87,5%).

Descriptores: Coinfection, Tuberculosis, Epidemiología.

INTRODUCTION

Tuberculosis (TB) and human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) are one of the leading causes of mortality from infectious diseases in resource-limited countries. In the individual the two pathogens, potentiate each other, accelerating the deterioration of immune functions. In the current context, HIV coinfection is the most important risk factor for the development of active TB, which increases the susceptibility to primary infection or reinfection and also the risk of reactivation of TB in patients with latent TB.

Infection with *M. tuberculosis* also has a negative impact on the immune response to HIV, accelerating the progression of HIV infection to AIDS.[1]

The World Health Organization (WHO) estimates that 36.9 million people worldwide live with HIV,[2] 25% of whom will be coinfected with tuberculosis. In this population, the risk of developing TB is increased in relation to those who do not have the virus, due to the reduction of the defenses, which is a condition that has a great impact on the mortality rate in developing countries.[3]

Therefore, regarding the HIV/TB coinfection, only during 2014, from the 9.6 million people who developed TB worldwide, 1.5 million died from this disease and 0.4 million were HIV positive.[2,4] In Brazil, the numbers reached 798,000 reported cases of people living with HIV/AIDS, and 63,189 new TB cases, then resulting in a coinfected rate of 9.7%.[5]

The *Rio de Janeiro* State concentrates 68 cases of TB per 100,000 inhabitants and the capital of *Rio de Janeiro* concentrates an incidence rate of 89.7 cases. An incidence considered high when compared to acceptable WHO data of 5/100,000.[2]

Adherence to antiretroviral and tuberculostatic therapies is an important measure in the reduction and control of HIV/TB cases, and thus the difficulty of adherence to treatment is an important factor for the continuation of the high rates of infection incidence and prevalence in the country, in addition to the increase in resistance to tuberculostatics, which is a problem due to the abandonment of TB treatment, strongly impacting the epidemiological situation of TB/HIV in Brazil.[6,7]

Thus, early diagnosis of coinfection and its correct treatment help reduce the incidence and mortality rate of the disease.[8] Hence, knowledge of the prevalence of coinfection and its determinants among the HIV-infected population in a local context will help to reduce the burden of disease by facilitating the detection.[9] The study's goal was to evaluate the prevalence of multidrug-resistant tuberculosis (MDR-TB)/HIV coinfection and the socio-demographic profile of MDR-TB/HIV coinfected cases in a referral hospital in *Rio de Janeiro* city.

METHODS

It is a cross-sectional study that is based on information collected from 40 patient records that are being treated for MDR-TB, at a referral hospital in *Rio de Janeiro* city, which is a public referral hospital in the care and treatment of patients with MDR-TB. The data were collected over the period from May to September 2016 through medical records analysis. Inclusion criteria were, as follows: patients with a diagnosis of MDR-TB and HIV-positive serology, aged 18 years old or older, and treated with a basic regimen recommended by the National Program to Combat Tuberculosis. As exclusion criteria, they chose patient records that presented incomplete information and lack of understanding.

The data collected from the medical records were gender, skin color, age, schooling, MDR-TB type and results of smear microscopy. Data were analyzed by the software SPPS (Statistical Package for Social Sciences) version 20.0.

Obeying the ethical and legal principles of research standards involving human beings, according to the Resolution No. 466/2012 and in Normative 001/2013, the project

was submitted to the approval of the Research Ethics Committee of the *Escola de Enfermagem Anna Nery (EEAN*) from the *Universidade Federal do Rio de Janeiro (UFRJ),* being approved under the protocol *Certificado de Apresentação para Apreciação Ética (CAAE)* [Certificate of Presentation for Ethical Appraisal] No. 54091116.7. 0000.5238.

RESULTS AND DISCUSSION

In the study period from May to September 2016, 40 cases of MDR-TB patients were diagnosed, of which 9 cases showed positive serology for HIV, representing a coinfection rate of 22.5%. The majority of the interviewees in this study were males (85.29%), average age was 37.5 years old, ranging from 18 to 62 years old. There was a rate of 55.5% for self-reported black skin color and 44.5% for white skin color. Considering the educational level analyzed among the participants, 44.4% had a college degree, 33.3% were incomplete high school and 22.3% were incomplete elementary school. The diagnosis of multidrug-resistant TB/HIV coinfection was prevalent in clinical pulmonary form (80%). In sputum smear microscopy, 66.6% had positive bacilloscopy, 74.9% had suggestive radiology, 77.7% had a positive culture and 100% had resistance to rifampicin in the Xpert Gene test. The drug rifampicin, isoniazid, and streptomycin were the most resistant in this group (87.5%).

Tuberculosis is one of the leading causes of death from infectious diseases worldwide, especially after the HIV epidemic event.[10]

In this study, 40 cases of MDR-TB were diagnosed during the study period. With monoresistance pattern of (35%), and multiresistance pattern of 65%. In Brazil in 2015, there were 1,027 cases of multidrug-resistant tuberculosis. Concerning the pattern of resistance of the cases in 2015, 476 (46.3%) were monoresistant, 442 (43.0%) of multiresistance, 72 (7.0%) of polyresistance, 8 (0.8%) of resistance and another 29 (2.8%) with resistance pattern not defined at the time of diagnosis. Still considering the year 2015, it was observed that the majority of the patients were male (67.4%) and the age group from 15 to 54 years old (80.6%).[14] These data were confirmed in this study where the majority of the patients were male 85.29% and the average age was 37.5 years old. Male prevalence in HIV/TB coinfection was also verified in studies conducted in Brazil, South Africa, Portugal, and China.[11,12,13] Thus, male vulnerability to HIV/TB coinfection can be underlined.

Tuberculosis is the 4th leading cause of death from infectious diseases and the 1st cause of death among defined infectious diseases of AIDS patients. This serious public health problem has deep social roots and is closely linked to poverty and poor income distribution, as well as the stigma that afflicts both family members and individuals.[14]

Tuberculosis can occur at any stage of HIV infection. The diagnosis in coinfection is similar to diagnosis in the general population. The differential is in the clinical symptoms, because in people infected with HIV, the disease may occur more frequently outside the lung and in a widespread manner in the body.[2] Nonetheless, in this study the rate of extrapulmonary tuberculosis was 20%, then being the pulmonary tuberculosis predominant.

The rate of coinfection presented in this study is similar in the literature15 and below the incidence rate where a co-infection rate of 31.2% was found.[16]

In Brazil, fifteen percent of new cases of tuberculosis are among HIV-infected individuals, reinforcing the recommendation for the systematic screening of TB for hospitalized patients with the HIV-related disease.[17] HIV-infected patients who have advanced immunosuppression present more frequently the disease in the form of hematogenous dissemination with multiorgan involvement. Often negative smears, necessitating blood culture and invasive procedures for diagnosis.[7,18] When assessed in this study, diagnostic tests for MDR-TB, 44% of patients had negative smear microscopy, (77.7%) had a positive result for *Mycobacterium* culture and 100% showed resistance to rifampicin in the GeneXpert TB test.

The need for timely treatment and diagnosis of both infections for the patient with HIV/TB coinfection is determinant in the prognosis and reduction of deaths in this clientele.[6,19] In 2015, in Brazil, the percentage of testing for HIV was 83.1%, and 18% of those tested had coinfection. A positive association was found between the AIDS coefficient and the TB incidence rate from 2001 to 2014. With each increase of 1 case of AIDS per 100,000 inhabitants, there was a 1.5% increase in the incidence of tuberculosis.[14] Herein, a prevalence of 22.5% of coinfected was observed, a number above what was found in the country and above the rate of 14% found in the Rio de Janeiro State during 2015.14,20 But confirmed in studies in the *Rio Grande do Sul* where the co-infection rate was 29.2%.[15]

The rate of coinfection in Brazil shows a dynamic of internalization of the disease, showing how social factors, to mention poverty and the lack of investments in effective prevention and treatment programs, influence and make difficult the coping of both pathologies, TB, which is the leading cause of death among infectious diseases defined in patients with HIV/AIDS.[21] The early initiation of antiretroviral therapy (ART) during treatment of TB is associated with a reduction in all causes of mortality in this group, and the early onset of ART in HIV patients reduces the risk of developing TB by approximately 65%.[1] Nevertheless, recent studies indicate that, globally, only one-third of HIV/TB coinfected patients receive ART in time appropriate. The barriers in different aspects of the treatment emphasize the need of commitment of the health services with this clientele, through the integration of care and services at all levels of care.[5]

Hence, MDR-TB has a negative impact on adherence to treatment, as it further aggravates the HIV/AIDS patient profile and the need to make changes in the ART regimen,

due to drug interactions and an increase in the number of drugs ingested and reactions.[2] As a coping strategy it is pointed out the Directly Observed Treatment, which is already established in Brazil for patients with MDR-TB undergoing treatment in the Family Health Strategy.[22]

The current situation of this disease in Brazil and its outstanding position in the classification of disease incidence in the world panorama, in addition to the high registers of multiresistant cases that do not respond to the known treatments, tend to be aggravated by the withdrawal of the monitoring of the indicators. The non-monitoring of disease-related indicators will create a risk for the population, a decrease in financial and human resources for TB control activities, therefore, causing a significant deterioration of TB epidemiological indicators.

CONCLUSIONS

The HIV/TB coinfection is a major global health issue. With socioeconomic vulnerability a significant effect on treatment outcomes among patients coinfected with HIV/TB in Brazil. Strengthening social support, incorporating alcohol abuse screening and counseling into current TB surveillance programs, and focusing interventions on specific age groups are interventions that can improve treatment outcomes. TB is a disease that most emblematically characterizes the social determination of poverty in the health/disease process of a population. The orientation of social assistance services is extremely important, enabling the protection of patients with tuberculosis, to help them overcome barriers imposed by prejudice and stigma. It is important to promote the joint massive work of social assistance networks, health network, and also to provide guidelines for enhancing the work of the professionals of the social assistance network towards tuberculosis bearing people. It should be noted that it also reflects the need to work more effectively with partners in the fight against this disease, whose control actions go beyond the health sector. Given the aforementioned context, we are concerned about the current economic situation and the recessive fiscal policy implemented in the country and that directly affect the social determinants related to tuberculosis, such as income, access to work and employment, education, housing etc.; furthermore, they may be a threat of withdrawing the advances made by *Sistema Único de Saúde (SUS)* [Unified Health System] and other public policies and social programs.

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