Original Article

Tuberculosis/HIV co-infection: sociodemographic and health profile of users of a specialized center

Coinfecção tuberculose/HIV: perfil sociodemográfico e saúde de usuários de um centro especializado

Coinfección tuberculosis/VIH: perfil sociodemográfico y salud de usuarios de un centro especializado

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How to cite:
Bastos SH, Taminato M, Tancredi MV, Luppi CG, Nichiata LY, Hino P. Tuberculosis/HIV co-infection: sociodemographic and health profile of users of a specialized center. Acta Paul Enferm. 2020;33:eAPE20190051.

DOI
http://dx.doi.org/10.37689/acta-ape/2020AO00515

Keywords
Tuberculosis; Acquired immunodeficiency syndrome; Community health nursing; Chronic disease; Health services

Descritores
Tuberculose; Síndrome da imunodeficiência adquirida; Enfermagem em saúde comunitária; Doenças crônicas; Serviços de saúde

Descriptores
Tuberculosis; Síndrome de inmunodeficiencia adquirida; Enfermería em salud comunitaria; Enfermedad crónica; Servicios de salud

Submitted
March 8, 2019

Accepted
December 18, 2020

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Abstract

Objective: To describe some sociodemographic features and health of individuals who present tuberculosis, and HIV co-infection of a specialized center located in the municipality of Sao Paulo.

Methods: This was a descriptive study of tuberculosis/HIV co-infection reported in a referral and training center of sexual transmissible diseases and AIDS in the municipality of Sao Paulo, conducted between 2007 and 2016. The source of information was a notification system and follow-up of tuberculosis cases.

Results: We notified 745 cases of co-infection, 76.6% were men, 67.8% were aged between 30 to 49 years, and 62.6% had 8 years or more of formal education. In relation to end of treatment of tuberculosis, 46.3% of cases evolved cure and 13.3% were death. The comparison of periods of notification from 2007-2011 and 2012-2016 can be observed by the occurrence of percentage reduction of 43.0% in the number of reported cases, and 76.6% in frequency of evolution of death.

Conclusion: The knowledge of the epidemiological situation of tuberculosis/HIV co-infection enables the provision of subsides to rethink the activities of health care and to enhance public policies.

Resumo

Objetivo: Descrever algumas características sociodemográficas e de saúde de pessoas que apresentaram a coinfecção tuberculose e vírus da imunodeficiência humana notificada em um centro especializado do município de São Paulo.

Métodos: Estudo descritivo de casos de coinfecção tuberculose/HIV notificados em um Centro de Referência e Treinamento de Doenças Sexualmente Transmissíveis e Aids do município de São Paulo, entre 2007 e 2016. A fonte de informações foi o Sistema de Notificação e Acompanhamento dos Casos de Tuberculose - TBWEB.

Resultados: Foram notificados 745 casos de coinfecção, 76,6% eram do sexo masculino, 67,8% encontravam-se na faixa etária de 30 a 49 anos e 62,6% possuíam oito anos ou mais de escolaridade. Em relação ao desfecho do tratamento da tuberculose, 46,3% dos casos evoluíram para cura e 13,3% foram a óbito. Ao comparar os períodos de notificação de 2007-2011 e 2012-2016, pôde-se observar que ocorreu uma redução percentual de 43,0% no número de casos notificados e 76,6% na frequência de evolução para óbito.

Conclusão: O conhecimento da situação epidemiológica da coinfecção tuberculose/HIV possibilita fornecer subsídios para repensar as atividades do cuidado em saúde e para o aprimoramento de políticas públicas.

Resumen

Objetivo: Describir algunas características sociodemográficas y de salud de personas que presentaron la coinfección tuberculosis y virus de la inmunodeficiencia humana notificada en un centro especializado del municipio de São Paulo.

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Conflicts of interest: Embora Hino P and Taminato M are associated editors of the Acta Paulista de Enfermagem, both editor do not have access to the manuscript review process.

Métodos: Estudio descriptivo de casos de coinfección tuberculosis/VIH notificados en un Centro de Referencia y Capacitación de Enfermedades de Transmisión Sexual y SIDA del municipio de São Paulo, entre 2007 y 2016. La fuente de información fue el Sistema de Notificación y Seguimiento de Casos de Tuberculosis (TBWEB).

Resultados: Se notificaron 745 casos de coinfección, el 76,6 % del sexo masculino, el 67,8 % del grupo de edad de 30 a 49 años y el 62,6 % con ocho o más años de escolaridad. Con relación al resultado del tratamiento de la tuberculosis, el 46,3 % de los casos se recuperó y el 13,9 % falleció. Al comparar los períodos de notificación 2007-2011 y 2012-2016, puede observarse que se redujo un 43,0 % la cantidad de casos notificados y un 76,6 % la frecuencia de muerte.

Conclusión: El conocimiento sobre la situación epidemiológica de la coinfección tuberculosis/VIH permite proporcionar subsidios para repensar las actividades de cuidado de la salud y para la mejora de políticas públicas.

Introduction

The occurrence of active tuberculosis (TB) in individuals living with human immunodeficiency virus (HIV) represents a challenge and impacts people infected by the HIV who present 26 times more chance to develop active TB compared with the general population.[1] In addition, there is frequent discovery of infection at diagnosis of TB.[2] Therefore, HIV represents a public health problem and has contributed to the increase of TB cases, therefore reflecting in healing, abandonment, and mortality rates.[3-4]

The TB occupies the 9th cause of death around the world, and affects mainly people living with HIV and AIDS (PLWHA). In 2017, we estimated that in the world, the occurrence of 6,708.123 notifications of TB and, of these, 6.9% had co-infection with HIV.[5] We observed in 2015 that Brazil occupies the 20º position of the priorities countries to approach TB, and the 19º position concerning the TB/HIV co-infection.[6]

In Brazil, the TB/HIV co-infection rate calculated for 2016 was 9.7%, ranging according to region of the country, from 7.9% in Northeast region to 17.3% in South region.[7] In 2016, we observed that in the country 73.2% of new cases of TB conducted testing for the HIV, and South region had a better performance (higher than 80%), followed by the Southeast (78.7%), the Center-East (67.1%), the North (66.8%) and the Northeast (62.1%). Although there is a recommendation to test for HIV all diagnosed cases for TB, given that the diagnosis of HIV, based on diagnosis of HIV gives the possibility to early administration of antiretroviral therapy (ART), there is a difference between regions of the country.[8]

Given the close relationship between TB and HIV, we highlight that these two diseases must be approached in an integral form by control programs. In this form these indicates the construction of one articulated proposed and according to particularities of individuals who present the co-infection.[9] There is the possibility of obtaining favorable results of control both with searching for cases in a way to improve early diagnosis and guarantee adherence to treatment.[10]

Treatment of people who present TB/HIV co-infection is more complex because it requires adherence to two therapeutic schemes: TB treatment must be done in period of at least 6 months, while the HIV treatment is continuous. In this form, the high amount of medicines to be taken daily and higher probability of occurrence of adverse events represent a challenge for adherence to treatment.[11]

A cross-sectional study conducted in a public hospital that presented the TB/HIV co-infection showed the adherence to compromised treatment in significant part of the interviewees, this had an negative impact in the health condition of these people. The correct follow-up of treatment for both TB and HIV is fundamental to guarantee that patients have good quality of life and longer life with reduced rates of abandonment of treatment and mortality.[11]

Therefore, for TB/HIV co-infection control is need. In addition, an action should be articulated in order to provide HIV testing to all people with diagnosis of TB. The treatment to active TB, and infant infection, as well as initiate, opportunely the ART.[12,13] Considering the relevance of the topic, this study had the following direction question: "What is the profile of people who present the TB/HIV co-infection considering a period of 10-years?".

Based on the situation presented, the objective of this study is to describe some sociodemographic features and health status of people with TB/HIV co-infection notified in an referral and training center of sexually transmitted diseases, and AIDS of the municipality of Sao Paulo.

Methods

This descriptive study included users who present TB/HIV co-infection assisted in an specialized center of the municipality of Sao Paulo. The population of the study was composed by all cases with diagnosis of TB and HIV, aged ≥ 18 years, and who presented diagnosis of TB and HIV in period of 10 years (January 2007 to December 2016). We excluded cases that conducted transference of follow-up to other service, and duplicated records in the system, i.e., those who present the same data of identification and diagnostic data.

In March 2018, we collected data concerning the sociodemographic and health profile of individuals with TB/HIV co-infection in the notification and follow-up of cases of tuberculosis – TBWEB, division of epidemiology of health service.

Variables of study were: sex, age range, race/ethnic, formal education, year of notification of TB, type of case, closing of treatment of TB, clinical form, classification, evolution, death, period of notification (2007/2011 and 2012/2016).

Information were storage in an electronic spreadsheet in the Microsoft Excel®, and analyzed using the SPSS software version 19. We used descriptive statistical tools (absolute and relative frequency) and analytics (Pearson X^2, level of significance of 5%).

This research project was approved by the ethical and research committee of the public university and by the health service in which data collection occurred (number of reports 2,408.003 e 2,476.518).

Results

During the period of the study (2007 to 2016), we reported 745 cases of TB/HIV co-infection. Of these total, 76.6% were men predominantly aged 30 to 49 years old (67.8%), white (60.8%) and who had 8 to 11 years of formal education (46.0%) (Table 1).

Table 1. Distribution of notified cases by tuberculosis and HIV according to some characteristics demographics. Center for DST/Aids reference

Variables	n(%)	p-value
Sex		0.323
Male	571(76.6)	
Female	174(23.4)	
Age range		0.823
≤ 19 years	12(1.6)	
20 to 29 years	99(13.3)	
30 to 39 years	262(35.2)	
40 to 49 years	243(32.6)	
50 to 59 years	107(14.4)	
60 to 69 years	19(2.5)	
70 to 79 years	3(0.4)	
Race/ethnic		0.739
White	453(60.8)	
Brown	170(22.8)	
Black	95(12.8)	
Not informed	16(2.1)	
Yellow	9(1.2)	
Indigenous	2(0.3)	
Formal education (years)		0.541
0 to 3	46(6.2)	
4 to 7	195(26.2)	
8 to 11	343(46.0)	
12 or more	124(16.6)	
Not informed	37(5.0)	
Total	745(100.0)	

Source: System of Notification and Follow-up of Tuberculosis cases - TB Web.

Table 2 presents information of cases that presented TB/HIV co-infection from 2007 to 2016. In relation to type of case, the majority was new case (63.3%), we highlight that during all the period only 11 (1.5%) of case were re-treated after death/resistance. Of the 745 notified cases in the period, 46.3% presented closure due to the cure, 22.8% abandonment, and 13.3% evolved to death. Concerning the classification, we observed an exclusive pulmonary form in 46.0% of cases and 25.0% had a mixed form (pulmonary and extra-pulmonary).

Table 3 presents the number of notified cases with TB/HIV co-infection and evolution for death according to the period of notification. The majority of case TB/HIV were reported between 2007 and 2011, and in this period we reported 476 cas-

Table 2. Cases of people who live with HIV according to type of tuberculosis case, closure and clinical form. STD/Aids reference and training center

Variables	n(%)	p-value
Type of case		0,572
New	474(63,6)	
Recurrence	131(17,6)	
Retreating/Abandonment	129(17,3)	
Recurrence after death/resistance	11(1,5)	
Closing		p<0,01
Cure	345(46,3)	
Abandonment	170(22,8)	
Change of the diagnosis	108(14,5)	
Death	99(13,3)	
Death/Resistance	12(1,6)	
Transference	8(1,1)	
Blank	3(0,4)	
Clinical format		0,169
Pulmonary	529(71,0)	
Peripheric ganglionar	56(7,5)	
Multiple organs	49(6,6)	
Meningeal	41(5,5)	
Pleural	33(4,4)	
Other forms	37(4,9)	
Classification		0,179
Pulmonary	343(46,0)	
Pulmonary + extra-pulmonary	186(25,0)	
Extrapulmonary	167(22,4)	
Disseminated	49(6,6)	
Total	745(100,0)	

Source: System of Notification and Follow-up of Tuberculosis cases - TB Web.

es, while in the subsequent period (2012/2016), we observed 269 reported cases, i.e., a reduction in percentage of occurrence by 43.0%. The evolution of death of reported cases was also higher from 2007 to 2011: 63.9, with reduction in subsequent period for 36.1%. The reduction of percentage of frequency of death between these 2 periods was 76.6%.

Table 3. Cases of TB/HIV co-infection according to evolution to death and period of notification. SDT/Aids referral and training center

Period of notification	Death Yes (n=99) n(%)	Total n(%)	p-value
2007 to 2011	75(75.8)	476(63.9)	0.042
2012 to 2016	24(24.2)	269(36.1)	
Total	99(100.0)	745(100.0)	

Source: System of Notification and Follow-up of Tuberculosis cases - TB Web.

Discussion

The analysis of sociodemographic features and health of individuals with TB/HIV co-infection who were notified in follow-up system of cases of tuberculosis showed a difference in terms of percentages of some variables.

The predominance of cases among men (76.6%) agrees with the finding reported in the published literature.[10-19] A possible cause for the predominance of men is concerned to the increase of notification of AIDS cases in this group, and the low detection and notification of AIDS among adult women from 2006 to 2017, which is expect among older women.[20] A systematic review (SR) conducted in low income countries showed that other possible reason is that men had a higher prevalence of TB, because of their delay to seek for health care, and remain longer time infected compared with women, a situation that reflects the diagnosis and opportune treatment.[21]

In our study, we observed a predominance of cases of individuals aged 30 to 49 years. Still, there is variable in national [14,15,17,19,22,23] and International published literature, [24,25] that highlight that this age range cover the phase in which people are economically active, a fact that can cause an impact directly to the family income and country's economy. However, in Brazil, where unemployment rates are high, there is possibility of verifying the impact on individuals who end-up to develop TB and HIV. A cross-sectional study conducted in the state of Ceará about adherence to antiretroviral that revealed a high index of unemployment among co-infections, in which, at the same time, were also individuals who had low adherence to ART compared with those who were employed.[11] A study conducted in Portugal as the objective to identify sociodemographic factors related with the incidence of TB, revealed that, in addition to the HIV, the unemployment was the a worsening factor for the incidence of TB, confirming that TB is socially determined disease.[26]

The variable race/ethnic that found higher frequency in this study that was white, which corroborate with other investigations.[12,27] On the other hand, researches pointed out the contrary, evidencing the predominance of race/ethnic black and brown.[10,13,14,19,28,29] A study conducted in the city of Sao Paulo in years from 2006 to 2013, which sought to analyze the epidemiological profile of new

cases of TB, revealed higher incidence of TB among indigenous people and black people.[23] A study conducted with the co-infected people diagnosed between January 2008 and July 2016 in the health service of the municipality of the Rio de Janeiro revealed longer delaying of health care to black and brown people, both in relation to seeking by care compared with their delaying.[30] However, because of the infection affects individuals regardless of race/skin color of a number of ethnics, this can be a subjective analysis.

In this study, we observed a high frequency of people who present TB/HIV co-infection with 8 years or more of formal education, different from the national literature, which pointed out lower formal education of co-infected individuals, many of them who were illiterate or who had attended only the primary education level.[10,12,13,17,19,28,29] A study of observational character conducted in China showed that 56% of co-infections had only the primary level and, in this way, a lower perception of their health.[31] However, this result can be due to characteristics of population assisted with this referral service.

National and international published literature reveal that people with TB/HIV co-infection had a higher risk of evolvement for death compared with those who had only TB.[3,22] The TB/HIV co-infection became the most susceptible person to advanced status of AIDS, which increases the risk of death, and it is still one of the main causes of death among hospitalized adults around the world, according to the SR conducted including studies from 42 countries.[32] These findings reinforced the relevance of the topic in efforts of public policies to reduce TB/HIV co-infection.

According to the Ministry of Health data,[29] we identified 6,501 new cases of co-infection in 2016 in Brazil, and of these, 78.4% had pulmonary clinic format. In the same year, according to the World Health Organization (WHO), of the 5.4 million of new cases of pulmonary TB in the world, 57% had bacteriology confirmation.[5] Of national findings[12,14,15,19,28] also showed an increase of extra-pulmonary clinical form. However, it is well know that diagnosis of TB among PLWHA can be difficult due to higher chance of false-negative exams, including the possibility of occurrence of extra-pulmonary forms and/or atypical pulmonary image in radiological exam.[15] A SR showed another issue, the issue of few studies existing about the relation of HIV and extra-pulmonary TB, being more studies necessary that can improve the discussion.[33]

Of the same way, we observed that early diagnosis of TB and opportune treatment of this co-infected people associated with improvement of life conditions and intersectoral actions can impact the control of TB.[34] A national study that analyzed new cases of TB in years from 1991 to 2010 in the city of Olinda – PE revealed that exams of sputum bacilloscopic and smear test we underused and that, along with lack of information about the result of anti-HIV test, avoided the knowledge of real situation of TB/HIV co-infection.[28] In the international ambit, findings of study conducted in the Nigeria revealed a high index of incidence of TB in individuals who were seropositive and who would initiate ART, showing the need of early realization of the TB test among HIV positive individuals to improve management of treatment.[35]

The high lethality in this specific group can be related to late diagnosis, low adherence to treatment, and development of resistance to the treatment.[11] We observed that fall in the mortality rate during the analyzed period. To explain this reduction, it is important to consider that a number of actions were organized and implemented during the time, such as back to investigation of two diseases. However, the early diagnosis and immediate beginning of TB treatment is fundamental, because death in cases of the TB/HIV co-infection occurs mainly in the first two months of TB treatment, given the reason that diagnosis must be done the earliest as possible, such as how testing is indispensable for HIV in total in cases diagnosis with TB.[10,13]

The adherence to treatment of these two diseases must be included by the establishment of the link between users and health professional, by the embracement environment and favorable to construction of possibilities that reduce suffering. For this

reason, to deal with people co-infected with TB/HIV imposes that professionals rethink health practice in amplified and humanized way, given the value to listen the meanings and perceptions of these people facing the health situation and treatments to be follow and, in this form, delivering quality care needed for demands and health needs.[4]

This study presents some limitations, such as the use of secondary data that evolves the issue of not fulfill some variables that include the compulsory notification form, and data collection to be done only in the TB – WEB, which impossibilities the access to other relevant information, such as, for example, the year of notification of HIV and use of the ART. In addition, the investigation was conducted only in STD/Aids referral center, a fact that reveals the local reality and would not be generalized.

Conclusion

This study enabled to understand the epidemiological situation of people with TB/HIV co-infection notified in the specialized center for period of 10 years. Results showed percentages differences of each variable and given the close relationship between both diseases, we can contribute to the organization of care actions for those living with HIV, such as implementation of public policies that involves the control both of the TB and HIV.

Acknowledgement

The National Technological and Science Council (CNPq; Shyrlaine Honda Bastos scholarship).

Collaborations

Bastos SH, Taminato M, Tancredi MV, Luppi CG, Nichiata LYI and Hino P collaborated with conception and development of the project, analysis of data, drafting the manuscript, critical revision relevant to intellectual content, and approval of final version to be published.

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