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Epidemiological profile of tuberculosis cases with HIV coinfection in Porto Alegre city, Brazil

Perfil epidemiológico dos casos de tuberculose com coinfecção HIV em Porto Alegre, Brasil

Perfil epidemiológico de los casos de tuberculosis con coinfección VIH en Porto Alegre

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ABSTRACT

Objective: To describe and compare the epidemiological profile of cases of tuberculosis and HIV coinfection of the District Administration Health Units of Porto Alegre, Brazil, from 2009 to 2013. **Method:** Retrospective cohort with data from national health information systems. Sociodemographic, clinical and follow-up variables were investigated through association tests. **Results**: 2,419 cases of tuberculosis and HIV coinfection were reported, with a mean age of 38 ± 9.91 years, predominantly white and with up to 7 years of study. The comparison between the District Administration Health Units was significant in terms of race/color (p<0.001), gender (p<0.001), schooling (p<0.004), age (p<0.003), place of origin (p<0.001), (p<0.001), alcoholism (p<0.001), indication and performance of Directly Observed Therapy (p<0.001), closure (p<0.001). **Conclusion**: Socioeconomic and treatment variables influence the occurrence of coinfection in different areas of Porto Alegre, reinforcing that the sum of different factors explains the indicators of the disease. **Descriptors:** Pulmonary Tuberculosis; Acquired Immunodeficiency Syndrome; Coinfection; Nursing; Public Health.

RESUMO

Objetivo: Descrever e comparar o perfil epidemiológico dos casos de coinfecção por Tuberculose e HIV, pela Gerência Distrital de Porto Alegre, no período de 2009 a 2013. **Método:** Coorte retrospectivo, com dados de sistemas nacionais de informação em saúde. Foram investigadas variáveis sociodemográficas, clínicas e de acompanhamento, por meio de testes de associação. **Resultados**: Foram notificados 2.419 casos de coinfecção Tuberculose e HIV, com média de idade de 38 ±9,91 anos, predominantemente brancos e com até 7 anos de estudo. A comparação entre as Gerências Distritais foi significativa quanto raça/cor (p<0,001), sexo (p<0,001), escolaridade (p<0,004), idade (p<0,003), local de origem (p<0,001), situação de entrada (p<0,001), alcoolismo (p<0,001), indicação e realização de Tratamento Diretamente Observado (p<0,001), situação de encerramento (p<0,001). **Conclusão:** Variáveis socioeconômicas e de realização do tratamento influenciam a ocorrência da coinfecção em diferentes áreas de Porto Alegre, reforçando que a soma de diferentes fatores explica os indicadores da doença.
Descritores: Tuberculose Pulmonar; Síndrome de Imunodeficiência Adquirida; Coinfecção; Enfermagem; Saúde Pública.

RESUMEN

Objetivo: Describir y comparar el perfil epidemiológico de los casos de coinfección por Tuberculosis y VIH, por la Gerencia Distrital de Porto Alegre, en el período de 2009 a 2013. **Método:** Cohorte, retrospectiva, con datos de sistemas nacionales de información en salud. Se investigaron variables sociodemográficas, clínicas y de seguimiento, por medio de pruebas de asociación. **Resultados**: Se notificaron 2.419 casos de coinfección Tuberculosis y VIH, con una media de edad de 38 ± 9,91 años, predominantemente blancos y con hasta 7 años de estudio. La comparación entre las Gerencias Distritales fue significativa como raza/color (p <0,001), sexo (p <0,001), escolaridad (p <0,004), edad (p <0,003), lugar de origen (p <0,001), situación de origen (p <0,001), alcoholismo (p <0,001), indicación y realización de tratamiento directamente observado (p <0,001), situación de cierre (p <0,001). **Conclusión**: Las variables socioeconómicas y de realización del tratamiento influencian la ocurrencia de la coinfección en diferentes áreas de Porto Alegre, reforzando que la suma de diferentes factores explica los indicadores de la enfermedad.
Descriptores: Tuberculosisi Pulmonar; Síndrome de Inmunodeficiencia Adquirida; Coinfección; Enfermería; Salud Pública.

INTRODUCTION

Public Health is a field that has developed in Brazil since the 70's, although its trajectory predates this. Its work encompasses human health in its multiple dimensions, ranging from epidemiological discussions and care practices to health education and management. Public Health contributes to the training of professionals qualified to work in the Brazilian Unified Health System (SUS - *Sistema Único de Saúde*) and to promote, in their daily practice, the principles and guidelines of universality, comprehensiveness, equity and social participation[1].

In this sense, Public Health, as a field of knowledge, helps professionals to know the elements that make up the biological, physical and social environments implicated in the health-disease process, as well as the characteristics of the users and the places where they live, influencing their performance in a way that is committed to SUS principles. The aim of this research was to discuss issues related to the disease profile of people coinfected with tuberculosis and Human Immunodeficiency Virus (HIV), considering the territories where they live.

Coinfection Tuberculosis and HIV presents itself as one of the most complex illnesses to be faced in the field of Public Health. The double burden of diseases (Tuberculosis and HIV) hinders adherence to treatments, which is evidenced by high dropout rates, contributing to multidrug resistance[2]. Studies have shown that the HIV/AIDS epidemic has contributed to the growth of the incidence rate of TB[3]. People living with HIV/AIDS have a 3 to 15% annual risk of reactivating latent tuberculosis infection, compared to the general population with a risk of 0.1%. In 2015, tuberculosis was one of the leading causes of death for people living with HIV worldwide, reaching approximately 1.4 million deaths, with 400,000 deaths resulting from tuberculosis among people living with HIV[2].

In Brazil, the southern region has the highest percentage of coinfection in the country (18.2%), almost twice the national average. In Brazil, it is believed that the rate of cure of new cases of tuberculosis, coupled with the abandonment of low treatment and good case detection, are factors that make it possible to reduce the incidence of tuberculosis[4]. The Ministry of Health recommends the testing and diagnosis of all people with HIV tuberculosis. In 2015the states of Paraná (82.0%), Santa Catarina (80.5%) and the capital cities of Curitiba- PR (85.7%) and Porto Alegre-RS (82.6%), had the highest percentages of HIV testing among people with tuberculosis. In the same year, the proportion of ideal cure (85% of cases) of tuberculosis in the southern region was not reached in any of the states and only the Paraná State (79.2%) obtained an approximate result. It was observed that the proportion of treatment abandonment of tuberculosis cases was above 5.0% in several states, especially in Rio Grande do Sul (15.1%)[4]. This data suggest that the southern region has potential for diagnosis of coinfection, but faces difficulties to maintain adherence and cure of tuberculosis.

Porto Alegre city is the second Brazilian capital with the highest incidence of TB, the first in incidence of HIV/AIDS and the one with the highest proportion of coinfection in the country, with 25% of cases diagnosed with TB in people living with HIV[4]. These epidemiological data demonstrate the importance of the city as an emblematic setting for the fight against tuberculosis and HIV coinfection in the national context.

OBJECTIVE

To describe and compare the epidemiological profile of tuberculosis and HIV coinfection cases of the District Administration Health Units of Porto Alegre city, from 2009 to 2013.

METHOD

Ethical aspects

The present study followed the guidelines of the Resolution 466/2012 of the National Health Council (*Conselho Nacional de Saúde*)[5]. The research project was approved by the Ethics and Research Committee of the *Universidade Federal do Rio Grande do Sul* (UFRGS) and by the Ethics Committee of the Municipal Government of Porto Alegre city.

Design, place of study and period

This is a retrospective cohort study with a quantitative approach, consisting of the analysis of the epidemiological profile of tuberculosis cases with coinfection Tuberculosis and HIV, residing in the city of Porto Alegre, reported by the *Sistema de Informação de Agravos de Notificação* (SINAN – Information System for Notifiable Diseases), from 2009 to 2013. In terms of public health management, the city is divided into *Gerências Distritais* (freely translated as District Administration Units- DAUs), which are: Center (CEN), North/*Eixo Baltazar* (NEB), East/Northeast (EANO), *Glória*/*Cruzeiro*/*Cristal* (GCC), South/Central South (SCS), *Partenon*/*Lomba do Pinheiro* (PLP), Sandbank/Extreme South (SES), Northwest/*Humaitá*/*Navegantes*/*Ilhas* (NHNI) [6].

Study population

Population-based study, which analyzed all cases of coinfection due to pulmonary tuberculosis and HIV in residents of the city of Porto Alegre, South region of Brazil, notified by the *Sistema de Informação de Agravos de Notificação* (SINAN – Information System for Notifiable Diseases). In the five-year period, 2,419 cases of coinfection.

Study protocol

As a source of information, cases that had the confirmed AIDS aggravation or the result of the HIV-positive diagnostic test were used. Tuberculosis and HIV coinfection were considered to be all cases reported for pulmonary tuberculosis in SINAN-TB that had a confirmed AIDS or HIV diagnosis. Subsequently, all cases with tuberculosis, which in the notification had an anti-HIV test with negative or ongoing results, were searched in the SINAN AIDS database to confirm or not coinfection. A linkage between the SINAN tuberculosis databases, SINAN AIDS was made based on the individual's full name and, in order to improve quality and reliability, the following variables were also checked: (a) date of birth; and (b) mother's name. The data came from the database

of the *Serviço de Vigilância Epidemiológica de Porto Alegre* (freely translated as Epidemiological Surveillance Service of Porto Alegre city). For the conference of the database, two researchers made the check and the information conference, requesting, when necessary, the conference of the data by a third researcher.

From 2009 to 2013, 8,813 cases of TB were found in the SINAN database. Of these, 2,286 cases had a diagnosis of AIDS at the time of TB notification (data extracted from field 39 of the notification form) and, therefore, were considered to be coinfected. There were 6,527 cases of TB that had no AIDS diagnosis on the TB notification form and had ongoing or unrecognized anti-HIV testing. These were searched individually in the SINAN AIDS database. We found 133 individuals who had AIDS notification in this database, but this record was not included in SINAN TB. After the conference on the SINAN TB database and the SINAN AIDS database, 2,286 from the SINAN TB base and 133 AIDS cases from the SINAN AIDS database were added, totaling 2,419 cases of coinfection.

Sociodemographic variables and epidemiological and clinical variables were investigated. The sociodemographic variables included: origin (District Administration Units), age, gender, race/color and schooling. Type of entry into SINAN, indication of Directly Observed Treatment (DOT), completion of DOT and case closure situation were the epidemiological and clinical variables analyzed. The type of entry was classified into a new case (never treated), relapse (it has already been cured and was again infected by tuberculosis or may be the persistence of tuberculosis bacilli in cured patients), reentry after cessation (abandoned treatment for TB and restarted) or transfer (when the individual was being treated at another health facility and was transferred). The type of closure variable refers to that occurring after the follow-up of treatment for TB, classified as: cure, abandonment, transfer, death or Multidrug-Resistant TB (MDR-TB).

Analysis of results and statistics

The analysis was performed using the software Statistical Package for the Social Sciences (SPSS), version 18.0, and software R, version 3.2.0. The age variable was evaluated for histogram distribution and the Kolmogorov-Smirnov test. This variable had a normal distribution and, therefore, was expressed as mean ± standard deviation. For the comparisons between the groups, the Chi-square test of Person or Fisher's exact test was used, and the T-student test for independent samples.

RESULTS

From 2009 to 2013, 2,419 cases of people coinfected with Tuberculosis and HIV were identified in Porto Alegre, considering reentry in the tuberculosis database. Table 1 shows the sociodemographic characteristics of cases of coinfection Tuberculosis and HIV. PLP was the DAU with the highest number of cases of coinfection, with 557 cases (23%). Men accounted for the majority of the cases, totaling 1,588 (65.6%). The mean age at the time of notification was 38 ± 9.91 years. Considering race/color, whites accounted for 1,357 cases (56.15%) and non-whites accounted for 1,054 cases (43.6%). As to schooling, 1,548 cases were studied for up to 7 years (64%), 629 cases studied between 8 and 11 years (26%) and 59 cases studied over 12 years (2.4%).

Table 1 - Sociodemographic characteristics of cases of coinfection Tuberculosis and HIV, from 2009 to 2013, in Porto Alegre, Rio Grande do Sul State, Brazil

Sociodemographic Characteristics	n (%)*
Administration Unit	
Center	430 (17.8)
Northwest/*Humaitá/Navegantes/Ilhas*	159 (6.6)
North/*Eixo Baltazar*	264 (10.9)
East/Northeast	380 (15.7)
Glória/Cruzeiro/Cristal	286 (11.8)
South/Central South	170 (7)
Partenon/Lomba do Pinheiro	557 (23)
Sandbank/Extreme South	171 (7.1)
Race/color	
White	1.357 (56.15)
Not White	1.054 (43.6)
Gender	
Male	1.588 (65.6)
Female	831 (34.4)
Schooling	
≤ 7 years	1.548 (64)
From 8 to 11 years	629 (26)
≥12 years or more	59 (2.4)

*Note - n=2.419 * Absolute and percentage number - (Totals may differ due to the possibility of non-response of the subjects or the non-completion by the professional of some data in the tuberculosis notification form).*

Table 2 - Epidemiological and clinical characteristics of cases of coinfection Tuberculosis and HIV, from 2009 to 2013, in Porto Alegre, Rio Grande do Sul State, Brazil

Clinical Characteristics	n (%)*
Type of Entry	
New case	1.389 (57,4)
Relapse	351 (14,5)
Reentry after abandonment	622 (25,7)
Transference	57 (2,4)
Alcoholism	
Yes	622 (25,7)
No	1.794 (74,2)
Diabetes	
Yes	67 (2,8)
No	2.348 (97,1)
Mental disorder	
Yes	99 (4,1)
No	2.314 (95,7)
TS Indication	
Yes	627 (25,9)
No	1.785 (73,8)
Directly Observed Treatment performance	
Yes	406 (16,8)
No	1.994 (82,4)
Type of Closure	
Cure	858 (35,5)
Abandonment	861 (35,6)
Death	536 (22,1)
Transference	88 (3,6)
Multidrug-Resistant Tuberculosis	63 (2,6)

*Note - n=2.419 *Absolute and percentage number - (Totals may differ due to the possibility of non-response of the subjects or the non-completion by the professional of some data in the tuberculosis notification form).*

Table 3 - Sociodemographic characteristics of Tuberculosis and HIV coinfection cases by District Administration, from 2009 to 2013, in Porto Alegre, Rio Grande do Sul, Brazil

Characteristics	District Administration Units								*p* value
	CEN	NHNI	NEB	EANO	GCC	SCS	PLP	SES	
Race/color									**<0.001***
White	271 (63%)	106 (66.7%)	166 (62.9%)	194 (51.3%)	172 (60.4%)	93 (55%)	276 (49.8%)	79 (46.5%)	
Not White	159 (37%)	53 (33.3%)	98 (37.1%)	184 (48.7%)	113 (39.6%)	76 (45%)	278 (50.2%)	91 (53.5%)	
Gender									**<0.001***
Female	117 (27.2%)	62 (39%)	86 (32.6%)	157 (41.3%)	110 (38.5%)	68 (40%)	162 (29.1%)	68 (39.8%)	
Male	313 (72.8%)	97 (61%)	178 (67.4%)	223 (58.7%)	176 (61.5%)	102 (60%)	395 (70.9%)	103 (60.2%)	
Schooling									0.004*
Up to 7 years	262 (67%)	103 (68.2%)	162 (63.8%)	243 (69.4%)	195 (73.9%)	104 (65%)	360 (71.1%)	117 (73.1%)	
From 8 to 11 years	106 (27.1%)	43 (28.5%)	89 (35%)	99 (28.3%)	66 (25%)	51 (32.3%)	135 (26.7%)	40 (25%)	
Above 12 years	23 (5.9%)	5 (3.3%)	3 (1.2%)	8 (2.3%)	3 (1.1%)	3 (1.9%)	11 (2.2%)	3 (1.9%)	
Age	38.36±10.03	37.29±9.32	38.91±10.80	37.55±9.71	36.24±9.40	39.69±10.87	37.70±9.50	39.69±9.85	0.003**
Total	430 (17.8%)	159 (6.6%)	264 (10.9%)	380 (15.7%)	286 (11.8%)	170 (7%)	557 (23%)	171 (7.1%)	

*Note: n=2.419 * P value associated with the homogeneity of proportions test based on Pearson's chi-square statistic. ** P value associated with the Kruskal-Wallis test. (Totals may differ due to the possibility of non-response of the subjects or the non-completion by the professional of some data in the tuberculosis notification form). Description of the District Administration: Center (CEN), North/Eixo Baltazar (NEB), East/Northeast (EANO), Glória/Cruzeiro/Cristal (GCC), South/Central South (SCS), Partenon/Lomba do Pinheiro (PLP), Sandbank/Extreme South (SES), Northwest/Humaitá/Navegantes/Ilhas (NHNI).*

Table 4 - Clinical epidemiological characteristics of Tuberculosis and HIV coinfection cases, by District Administration, from 2009 to 2013, in Porto Alegre, Rio Grande do Sul State, Brazil

Characteristics	District Administration Units								*p* value
	CEN	NHNI	NEB	EANO	GCC	SCS	PLP	SES	
Type of entry									**<0.001***
New case	234 (54.4%)	105 (66%)	159 (60.2%)	199 (52.4%)	166 (58%)	114 (67.1%)	311 (55.8%)	101 (59.1%)	
Relapse	56 (13%)	23 (14.5%)	36 (13.6%)	45 (11.8%)	29 (10.1%)	19 (11.2%)	110 (19.7%)	33 (19.3%)	
Reentry	133 (30.9%)	25 (15.7%)	65 (24.6%)	130 (34.2%)	84 (29.4%)	33 (19.4%)	115 (20.6%)	36 (21.1%)	
Transference	7 (1.6%)	6 (3.8%)	4 (1.5%)	6 (1.6%)	7 (2.4%)	4 (2.4%)	21 (3.8%)	1 (0.6%)	
Alcoholism									**<0.001***
Yes	143 (33.3%)	30 (18.9%)	76 (28.8%)	110 (28.9%)	82 (28.8%)	44 (25.9%)	110 (19.8%)	27 (15.8%)	
No	287 (66.7%)	129 (81.1%)	188 (71.2%)	270 (71.1%)	203 (71.2%)	126 (74.1%)	445 (80.2%)	144 (84.2%)	
Diabetes									0.368*
Yes	11 (2.6%)	6 (3.8%)	9 (3.4%)	14 (3.7%)	6 (2.1%)	5 (2.9%)	16 (2.9%)	0 (0%)	
No	418 (97.4%)	153 (96.2%)	255 (96.6%)	366 (96.3%)	279 (97.9%)	165 (97.1%)	539 (97.1%)	171 (100%)	
Mental disorder									0.325*
Yes	19 (4.4%)	7 (4.4%)	9 (3.4%)	22 (5.8%)	9 (3.2%)	3 (1.8%)	26 (4.7%)	4 (2.3%)	
No	419 (95.6%)	152 (95.5%)	255 (96.6%)	357 (94.2%)	275 (96.8%)	167 (98.2%)	528 (95.3%)	167 (97.7%)	
Type of Closure									**<0.001***
Cure	126 (29.4%)	75 (47.5%)	117 (44.3%)	95 (25.3%)	79 (27.6%)	67 (39.4%)	229 (41.6%)	70 (41.2%)	
Abandonment	185 (43.1%)	33 (20.9%)	79 (29.9%)	172 (45.7%)	117 (40.9%)	50 (29.4%)	169 (30.7%)	56 (32.9%)	
Death	95 (22.1%)	44 (27.7%)	57 (21.6%)	86 (22.6%)	59 (20.6%)	40 (23.5%)	105 (18.8%)	42 (24.5%)	
Transference	12 (2.8%)	3 (1.9%)	7 (2.7%)	9 (2.4%)	8 (2.8%)	7 (4.1%)	41 (7.4%)	0 (0%)	
MDR-TB	11 (2.6%)	3 (1.9%)	4 (1.5%)	14 (3.7%)	16 (5.6%)	6 (3.5%)	7 (1.3%)	2 (1.2%)	
Indicated DOT									**<0.001***
Yes	142 (33%)	26 (16.5 %)	53 (20.1%)	88 (23.2%)	84 (29.4%)	41 (24.4%)	155 (28%)	38 (22.2%)	
No	288 (67%)	132 (83.5%)	211 (79.9%)	291 (76.8%)	202 (70.6%)	127 (75.6%)	399 (72%)	133 (77.8%)	
DOT Performance									**<0.001***
Yes	111 (20.6%)	17 (10.8%)	26 (9.9%)	57 (15.2%)	40 (14%)	16 (9.5%)	112 (20.4%)	27 (15.8%)	
No	316 (74%)	141 (89.2%)	237 (90.1%)	319 (84.8%)	245 (86%)	152 (90.5%)	438 (79.6%)	144 (84.2%)	
Total	430 (17.8%)	159 (6.6%)	264 (10.9%)	380 (15.7%)	286 (11.8%)	170 (7%)	557 (23%)	171 (7.1%)	

*Note: n=2.419 * P value associated with the homogeneity of proportions test based on Pearson's chi-square statistic. (Totals may differ due to the possibility of non-response of the subjects or the non-completion by the professional of some data in the tuberculosis notification form). Description of the District Administrations: Center (CEN), North/Eixo Baltazar (NEB), East/Northeast (EANO), Glória/Cruzeiro/Cristal (GCC), South/Central South (SCS), Partenon/Lomba do Pinheiro (PLP), Sandbank/Extreme South (SES), Northwest/Humaitá/Navegantes/Ilhas (NHNI). Multidrug-Resistant Tuberculosis-MDR-TB; Directly Observed Treatment-DOT.*

Table 2 describes the epidemiological and clinical characteristics of cases of coinfection Tuberculosis and HIV. As to the type of case entry in the health surveillance system, new cases totaled 1,389 (57.4%), followed by relapses with 351 cases (14.5%), rehospitalization after abandonment with 622 cases (25.7% %) and transfers with 57 cases (2.4%). At the conclusion of the surveillance, the cure outcome was verified in 858 cases (35.5%), treatment abandonment occurred in 861 cases (35.6%), deaths totaled 536 cases (22.1%), the transfers occurred in 88 cases (3.6%) and MDR-TB added up to 63 cases (2.6%). Alcoholism was present in 622 cases (25.7%), followed by other mental illnesses in 99 cases (4.1%) and diabetes in 67 cases (2.8%). Directly Observed Treatment was indicated for 627 cases (25.9%), but was performed in 406 (16.8%).

Table 3 shows the sociodemographic characteristics of cases of coinfection Tuberculosis and HIV in the eight DAUs of Porto Alegre. Regarding the race/color question, there was a statistically significant difference in the comparison of proportions by administration units. It was observed a predominance of the white race in six DAU, and this percentage ranged from 51.3% to 66.7%. The exception was observed in SES and PLP DAU, where whites accounted for 46.5% and 49.8%, respectively (p <0.001). Regarding gender, men accounted for the majority of cases in all DAUs, with a proportion ranging from 60% to 72.8% (p <0.001). In all DAUs, most cases had schooling up to 7 years. Higher discrepancies were observed in the proportion of cases with up to 7 years of schooling that reached 73.9% of the cases in the GCC DAU; cases with 8 to 11 years of schooling that accounted for 35% of the cases in the NEB DAU and individuals with more than 12 years of schooling, which accounted for 5.9% of the cases in the CEN DAU (p=0.004). Differences between age averages at the time of TB notification were observed (p=0.003), the variation was 37.29 ± 9.32 years in the NHNI DAU until a mean of 39.69 ± 10.87 years in the SCS DAU.

Table 4 shows the clinical epidemiological characteristics of the cases of coinfection in the eight DAUs of Porto Alegre city. As to the situation of entry of the case, differences in proportions were evidenced (p <0.001). New cases accounted for 52.4% of the cases in the EANO DAU, while in SCS management they accounted for 67.1%. Relapse accounted for 10.1% of the cases in the GCC DAU, reaching 19.7% of the cases in the PLP DAU. Reentry accounted for 15.7% of the cases in the NHNI DAU, reaching 34.2% in EANO DAU. The percentage of transferences ranged from 0.6% of the cases in the SES DAU, reaching 3.8% of the cases in the NHNI DAU and the PLP DAU.

Regarding the associated diseases, the occurrence of alcoholism ranged from 15.8% of the cases in the SES DAU to 33.3% of the cases in the CEN DAU (p <0.001). The occurrence of diabetes and mental disorder did not present a statistically significant difference between DAUs (p=0.368 and p=0.325, respectively). In relation to the closure situation in the surveillance, significant differences were observed (p <0.001). Cure accounted for 25.3% of the cases in the EANO DAU and reached 47.5% of the cases in the NHNI DAU. Abandonment to treatment totaled 20.9% of the cases in the NHNI DAU and 45.7% of the cases in the EANO DAU. Death occurred in 18.8% of the cases in the PLP DAU and 27.7% of the cases in the NHNI DAU. While in the RES management there was no case of transference, in the PLP DAU the transfers reached 7.4% of the cases. MDR-TB occurred in 1.2% of the cases in the SES DAU and up to 5.6% in the GCC DAU.

DOT showed a significant difference between DAUs (p <0.001). The variability was 16.5% of the cases in NHNI management, up to 33% of the cases in the CEN DAU. DOT performance had lower percentages than the indication in all DAUs. The achievement ratio also presented a statistical difference between DAUs (p <0.001). The lowest percentage was observed in the SCS DAU with 9.5% of the cases and the highest percentage was observed in the CEN DAU with 20.6%.

DISCUSSION

The analysis of stratified indicators allows the identification of the singularities of each territory. In this sense, analyzes were made considering race/color, age, schooling, gender, place of residence, alcoholism and treatment. This study shows that the epidemiological profile of people with coinfection is predominantly male, with predominance of white race, low schooling, mean age of 38 ± 9.91 years, whose entry situation in SINAN occurs as a new case, corroborating with data from other studies[7-8].

Most of the people who developed coinfection were men. Such situation leads to the question of how gender and gender crossings can contribute to men and women becoming ill differently in each territory. Gender differences were found in other surveys[9-10]. Sociocultural characteristics can influence the way men and women take care of their health, adhere to and abandon treatments, as well as opt for certain behaviors and risks in different contexts[11].

The mean age at the time of notification in Porto Alegre was 38 ± 9.91 years. This data is similar to other studies[10,12], indicating that the population most affected is precisely that of an age group corresponding to the economically active population, and that, therefore, illness affects important impacts on society.

In this study, income information was not available and, therefore, schooling was used as a socioeconomic condition proxy. In the sample studied, 67.8% had up to 7 years of schooling. Although some studies point to income as an important social indicator in the establishment of the individual's living conditions[13], few studies use information about individuals' income, since this information does not exist in national health information systems and their collection is difficult[14]. Individuals with lower schooling, a feature that is often associated with several other unfavorable social conditions (inadequate housing, insufficient food, poor access to public transportation, distance from health services) may delay the demand for health services and, consequently, the access to diagnosis and treatment[14].

The distribution of cases considering the variable race/color showed that coinfection affects different white and nonwhite modes, evidencing social inequities in health[15]. It was observed that the coinfection reaches more non-whites two District Administration Units, PLP and SES, which needs to be better evaluated in terms of public policies. Studies have pointed out differences in TB and coinfection rates considering race/color, being observed that, especially, blacks are more affected[15-16].

Regarding the occurrence of other disorders in cases of coinfection, alcoholism was a significant marker for its development,

similarly to other national and international studies that have already shown this association[15,17]. In the present study, comparing the DAUs, the Center DAU stands out, with 33.3% of the cases of coinfection with alcoholism (p <0.001). It is believed that this difference occurs especially related to social conditions, since there is a high prevalence of street individuals in this DAU. In general, studies indicate that many individuals, who are ill with coinfection, are using alcohol and other drugs, especially crack and marijuana, and also cause mental health problems[17-18].

As for the situation of entry of coinfection cases into the surveillance system, national and international studies show that the percentage of new cases is higher than 80%([10,12,19]. The results found in the present study demonstrate that more than 40% of the entries in Porto Alegre were cases of reentry after abandonment and relapse. An in-depth analysis of the reasons for not adhering to the treatment of coinfection would be necessary, measuring the social and welfare variables that involve illness due to coinfection.

The difficulty of treatment is also expressed in the situation of closure of cases in epidemiological surveillance, since the cure rate was very low (35.5%), with high rates of abandonment (35.6%), deaths (22.2%) and MDR-TB (2.6%). Studies have shown rates of abandonment ranging from 7 to 14% and cure rates ranging from 40 to 80%[10-11,19]. An explanatory hypothesis for this result is that, unlike other settings, there is in Porto Alegre an expressive number of cases at the entrance of the surveillance that corresponds to cases of abandonment. As previously discussed, those cases can be of individuals with greater compromise of the immune system and, therefore, with greater probability of developing the multiresistance and occurrence of death.

Another explanation can be that in Porto Alegre, about 48% of the diagnoses of tuberculosis cases occurred in hospital units, that is, when symptoms worsen[6]. In addition, the primary care and reference services of Porto Alegre, are having difficulties in following up the cases of TB and HIV/AIDS, making it difficult to indicate and perform DOT[20].

The highest proportion of cases of coinfection is in the PLU DAU. This is a region with a very low Quality of Life Index (QoLI) and a very high Social Vulnerability Index (SVI). Low schooling, high rates of violence and mortality due to external causes, low longevity, large number of families living in poverty and extreme poverty; as well as high population agglomeration in large villages, often built in irregular areas are usually present in the region [6].

DOT was indicated and performed more frequently on PLP DAU and CEN DAU. This has been a strategy indicated by the World Health Organization and the Ministry of Health as a possibility to ensure a greater link between health professionals and users with coinfection, as well as a greater adherence to drug treatment for TB. Studies show that DOT is effective for cases of TB and for cases of coinfection Tuberculosis and HIV, because when comparing cases with and without DOT, cure percentages were higher and mortality was lower in the DOT group[21-23].

Study limitations

This study presents some inherent limitations to the method, referring to the retrospective design, which does not have direct quality control performed by the researcher. It should be noted that the data were extracted from a nationally used surveillance system. Despite the standardization of the notification sheets and the guidance manuals for correct tool filling, small inconsistencies were found between the databases that possibly occur due to the lack of precision of the professionals who fill out the notification sheets that feed them.

Contributions for the sectors of Nursing, Health and Public Policies

The recognition of the epidemiological profile of cases of coinfection helps in understanding the complexity of the problem and the need to establish new strategies for coping with it. Due to the high rates of coinfection in Porto Alegre city, it is relevant to investigate possible territories of intervention that result in the reduction of social inequalities and, consequently, in the improvement of the epidemiological indicators of the coinfection Tuberculosis and HIV.

It is important to emphasize the importance of nurses and other health professionals to know more frequently the profile of these cases of coinfection in these territories and, from that, to propose, to plan and implement control/prevention measures, guaranteeing an adequate Health Care to people with coinfection Tuberculosis and HIV. The nurse is a professional who works in all settings and health services that perform care for the subject with coinfection. Nurses actively participate in the diagnosis, follow-up and surveillance of Tuberculosis and HIV cases, and are responsible for the recommendation of DOT and the administration of the treatment to the user. It was not possible to measure in this study the performance of different professional categories in the indication and performance of the DOT, being a gap to be explored in further studies.

The findings of the present study contribute to the practice of health professionals, since they allow a reflection on some markers such as gender, race/color, schooling, place of residence, alcohol use and their effects on the production of inequalities, discrimination, exploitation and oppression. This helps to uncover the settings in which coinfection by Tuberculosis and HIV occurs. Such knowledge may contribute to the response that coinfection demands in the field of Public Health, especially when it recognizes that health proposals need to seek to reduce vulnerabilities without neglecting to address social inequalities.

CONCLUSION

This study described and compared the epidemiological profile of tuberculosis and HIV coinfection cases in different areas of Porto Alegre, highlighting the most frequent socioeconomic and clinical variables in those cases, such as low schooling, race/color, gender, District Administration Health Unit of origin of the case, type of entry and closure of the case in SINAN, alcoholism, the indication and performance of DOT, are

Further studies are needed to identify what are the characteristics of these territories with a higher proportion of cases and the services that care for people with coinfection. It is also

important to investigate the reasons why these settings present the worst indicators and study the difficulties of structuring a service network that guarantees access to care and cases resolution. This should allow a more in-depth analysis of why DOT is not recommended and performed. There is a strong determination of social conditions in the coinfection cases, which indicates that health interventions should not be limited to offer access to medicines, but work in an intersectorial mode.

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