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Prevalence and associated factors of tuberculosis treatment abandonment

Prevalência e fatores associados ao abandono do tratamento da tuberculose

Prevalencia y factores asociados al abandono del tratamiento de la tuberculosis

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ABSTRACT

Objective: To estimate the prevalence of tuberculosis treatment abandonment and its associated factors. **Method:** Cross-sectional study which used cases of tuberculosis in the System of Information on Notification Aggravations (*Sistema de Informação de Agravos de Notificação*) from 2001 to 2017 in Ceará state. This study included 74,006 cases and the outcome was the closing situation "treatment abandonment". A multivariate analysis was performed to estimate the association between the variables with abandonment. **Results:** Throughout the period, the abandonment rate was 12.54%. A higher abandonment prevalence was verified among people who live in the urban zone (PR = 2.45; 95%CI: 2.20-2.74), who are readmitted after abandonment (PR = 2.84; 95%CI: 2.68-3.01), among those notified as recurrent (PR = 1.22; 95%CI: 1.10-1.35) and among drinkers (PR = 1.50; 95%CI: 1.42-1.58). Those who were sputum smear-positive (PR = 1.11; 95%CI: 1.03-1.19) or for whom sputum smear was unperformed (PR = 1.30; 95%CI: 1.20-1.40), coinfection (PR = 2.04; CI95%: 1.89-2.21) and who were not submitted to serology (PR = 1.62; 95%CI: 1.53-1.71) have also a higher prevalence of tuberculosis treatment abandonment. **Conclusion:** Tuberculosis treatment abandonment is associated to biological and social factors, habits, and health service structure.

DESCRIPTORS

Tuberculosis; Treatment Refusal; Epidemiology; Cross-Sectional Studies.

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INTRODUCTION

Tuberculosis (TB) is an important aggravation of global concern. According to the World Health Organization (WHO), in 2019 circa 10 million people were estimated to have been infected and 1.4 million were estimated to have died. Also, 87% of yearly notified cases are estimated to take place in the 30 countries with the highest load of this disease[1].

Brazil is one of the countries listed by WHO as presenting the highest rates of TB and of TB-HIV co-infection. This country had 73,834 new registered TB cases in 2019, with an incidence coefficient of 35 cases/100,000 citizens. Disease growth was observed both when only municipalities with the best socioeconomic conditions were taken into account and when territories with the worst life conditions were considered[2].

In Brazil, the state of Ceará is particularly relevant, since over the last years it has presented an increase in the number of notified cases and an incidence of 35 cases/100,000 citizens. In addition, it is necessary to study TB in Ceará, since this is one of the Brazilian states with twice the abandonment rates recommended by the WHO, requiring improved inclusion policies and protection of rights[3].

Given this context, treatment abandonment is noteworthy, since it is presented as an influent factor on the success for disease management programs. The WHO points out that 85% of all TB cases present cure as an outcome and, at most, 5% as abandonment[4].

Thus, avoiding this outcome and facilitating adherence is fundamental even in areas with lower TB rates[5]. The literature points out that abandonment may be due to patient-related factors (education, drug abuse, unemployment), to the health services (access and structure) and to treatment characteristics (duration and adverse effects)[6-7] and poses a crucial obstacle to cure as it increases morbidity, mortality, and drug resistance[8].

Patients are thus expected to undergo standard therapy upon diagnosis; this lasts for circa six months and ends with the expected favorable outcome: cure. However, this is not observed in clinical practice, considering that most individuals abandon treatment and are treated multiple times. Thus, to create efficient adherence strategies, factors more closely associated to this outcome must be known. Therefore, the objective of this study was to estimate the prevalence of TB treatment abandonment and its associated factors.

METHOD

Design of study

This is a cross-sectional study.

Scenario

This study was performed in 2018 in Fortaleza, the capital of Ceará, one of the nine states of the Brazilian Northeast Region. Ceará has the eighth biggest population of Brazil (estimated as circa 9.13 million citizens), distributed across 184 municipalities and a demographic density of 56.76 citizens per Km^2 (11th nationwide). Ceará is one of the most unequal states in Brazil, presenting a Human Development Index of 0.682 (17th in Brazil) and one of the worst values for monthly nominal income *per capita*: around 850 reais (Brazilian currency BRL) (22nd in Brazil)[9].

Selection criteria

The source of the data used in this study was the System of Information on Notification Aggravations (*Sistema de Informação de Agravos de Notificação* – Sinan) for TB. The system is formed by a set of variables which are obtained through a disease notification and follow-up form. These forms are filled by health professionals who report the disease and are typed by professionals of the municipal health office. The compiled data of all municipalities are sent to the state health offices which consolidate them and send them to the Ministry of Health.

The state database encompassed all cases reported from January 2001 to December 2017 in the state of Ceará. The adopted inclusion criterion was case notification and insertion into the database. The exclusion criterion was unregistered outcome variable "termination status". The study had a population of 75,948 notifications; out of these, 1,942 were excluded for not bringing information on the case's termination status and thus 74,006 registers were included into the final sample. Many cases had other variables unspecified, but they were maintained in the study, since other variables might be used in the analysis.

The outcome was defined in accordance with the Brazilian Ministry of Health's criterion. A case was thus notified as abandonment when patients stopped visiting the health service for more than 30 days in a row after their scheduled follow-up date. When the patient was undergoing supervised treatment, this was considered as 30 days from the last medication intake[10].

Data collection

Data from the Ceará State Health Office (*Secretaria de Saúde do Estado do Ceará* - SESA), originating from Sinan-TB, were collected in August 2018 by the main researcher with the Ceará state's surveillance coordinator. The variables in the notification form for TB considered as possible predictors of the disease were: sex, age, education, race, living area, type of admission, disease form, conduction of sputum smear, conduction of sputum culture, conduction of AIDS and HIV exams, drinking status and conduction of supervised treatment. Other variables of the database were excluded due to presenting absent data over 30%; however, the variables "AIDS" and "drinking status" presented absent data over this value, but were kept due to their importance for disease epidemiology and outcomes.

As an outcome variable, the chosen termination status was treatment abandonment. When necessary, these variables were transformed into *dummy* variables to conduct the

analyses, which are binary variables created to represent the variable which originally had multiple categories.

Data analysis and treatment

For data analysis, simple and relative frequencies were used to verify the prevalence of each nominal variable in the outcome. However, when applying the Shapiro-Wilk test, age was verified not to have a normal distribution ($p < 0.001$), so presenting it through median and interquartile range (IQR) was preferred.

To verify the association of the variables with the outcome, chi-squared test was employed, and, for the numeric variable, Mann-Whitney test was employed. In both cases, they were considered significant when $p < 0.05$.

To calculate the Prevalence Ratio (PR) of the predictors, Poisson regression model with robust variance was used. This model was chosen with the objective of verifying the estimate of scores with higher reliability and narrow confidence intervals (CI95%). The multivariate model was adjusted for age (continuous), sex, and education. In the initial model, all predictive variables presenting $p<0.20$ were inserted and, one by one, those with the highest p-value were removed[11]. Thus, only those considered statistically significant were maintained in the final model ($p < 0.05$). All analyses were performed in the Stata 12.0 software (StataCorp LP, College Station, TX, USA).

Ethical aspects

Even though there was no direct contact with the study's patients, the database includes individual information of each registered individual. Thus, the project was developed abiding by the ethical and legal principles of Resolutions No. 466/12 and No. 510/2016 by the National Health Council and was submitted to the appraisal of the Ethics Committee of *Universidade Estadual do Ceará* (UECE), being approved under protocol n. 2.687.046, dated 2018. During data collection, the researcher, with the Health Surveillance Center of the Ceará State's Health Office, has removed any attributes which could identify the participants, such as name, mother's name, and address.

RESULTS

The 74,006 study participants had a mean age of 38 years (IQ 26 – 52). Most were male (62.9%; n = 46,537), self-declared as brown (72.6%; 42,768) and lived in the urban zone (84.2%; n = 60,235). Approximately three in every four individuals had low education, since this was equal to or lower than incomplete second cycle of primary education (74.08%; n = 39,419). Among all participants, a prevalence of 12,54% for TB treatment abandonment was identified (n = 9,280). All sociodemographic variables were shown to be statistically significant with abandonment ($p < 0.001$) (Table 1).

Table 1 – Sociodemographic characteristics of patients with tuberculosis treatment abandonment, 2001-2017 – Fortaleza (CE), Brazil, 2018.

	Total (%)	Abandonment		P
		Yes (%)	No (%)	
Age (median)	38 (26 – 52)	35 (25 – 45)	38 (26 – 53)	< 0.001
Sex (n = 73,984)				
Female	27,447 (37.10)	2,822 (10.28)	24,625 (89.72)	< 0.001
Male	46,537 (62.90)	6,457 (13.87)	40,080 (86.13)	
Race/Color (n = 58,941)				< 0.001
White	10,231 (17.36)	864 (8.44)	9,367 (91.56)	
Black	4,962 (8.42)	667 (13.44)	4,295 (86.56)	
Asian	726 (1.23)	88 (12.12)	638 (87.88)	
Brown	42,768 (72.56)	5,573 (13.03)	37,195 (86.97)	
Indigenous	254 (0.43)	22 (8.66)	232 (91.34)	
Education (n = 53,213)				< 0.001
Illiterate	9,890 (18.59)	1,170 (11.83)	8,720 (88.17)	
Primary Ed. Incomp. 1st cycle	12,411 (23.32)	1,478 (11.91)	10,933 (88.09)	
Primary Ed. Comp. 1st cycle	3,679 (6.91)	491 (13.35)	3,188 (86.65)	
Primary Ed. Incomp. 2nd cycle	13,439 (25.26)	1,818 (13.53)	11,621 (86.47)	
Primary Ed. Comp. 2nd cycle	3,060 (5.75)	376 (12.29)	2,684 (87.71)	
Incomp. Sec. Ed.	5,110 (9.60)	495 (9.69)	4,615 (90.31)	
Comp. Sec. Ed.	3,673 (6.90)	283 (7.70)	3,390 (92.30)	
Incomp. higher ed.	515 (0.97)	39 (7.57)	476 (92.43)	

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	Total (%)	Abandonment		P
		Yes (%)	No (%)	
Comp. higher ed.	1,436 (2.70)	81 (5.64)	1,355 (94.36)	
Living area (n = 71,536)				< 0.001
Urban	60,235 (84.20)	8,436 (14.01)	51,799 (85.99)	
Rural	10,826 (15.14)	528 (4.88)	10,298 (95.12)	
Peri-urban	475 (0.66)	31 (6.53)	444 (93.47)	

Concerning clinical-epidemiological characteristics, it is possible to identify in Table 2 that the new cases represent around 82% of the notifications (n = 60,614), and the pulmonary form is the most prevalent one (82.7%; n = 64,524). Concerning the performed exams, 5.3% of the sample presented a positive exam for HIV and, in an expressive share of the individuals, sputum smear was positive (58.8%; n = 43,539) and the culture criterion did not apply (81.1%; n = 60,043). The aggravations AIDS and being a drinker were observed for 8.4% (n=3,428) and 20.2% (n = 9,414) of the studied population, respectively, and the supervised treatment was performed by a little more than half the notified cases (55.3%; n = 33,630). Like the sociodemographic variables, all clinical-epidemiological variables were statistically significant with treatment abandonment (p < 0.001).

Table 2 – Clinical and laboratory characteristics of patients who abandoned tuberculosis treatment, 2001-2017 – Fortaleza (CE), Brazil, 2018.

	Total	Abandonment		P
		Yes (%)	No (%)	
Type of admission (n = 73,944)				< 0.001
New case	60,614 (81.97)	6,402 (10.56)	54,212 (89.44)	
Recurrence	5,028 (6.80)	728 (14.48)	4,300 (85.52)	
Post-abandonment readmittance	4,302 (5.82)	1,712 (39.80)	2,590 (60.20)	
Unsure	843 (1.14)	164 (19.45)	679 (80.55)	
Transference	3,157 (4.27)	273 (8.65)	2,884 (91.35)	
Disease form (n = 73,988)				< 0.001
Pulmonary	64,524 (87.21)	8,265 (12.81)	56,259 (87.19)	
Extrapulmonary	8,192 (11.07)	827 (10.10)	7,365 (89.90)	
Mixed	1,272 (1.72)	187 (14.70)	1,085 (85.30)	
Sputum smear (n = 73,988)				
Positive	43,539 (58.84)	5,410 (12.43)	38,129 (87.57)	< 0.001
Negative	14,495 (19.59)	1,398 (9.64)	13,097 (90.36)	
Unperformed	15,364 (20.77)	2,368 (15.41)	12,996 (84.59)	
Unapplicable	590 (0.80)	103 (17.46)	487 (82.54)	
Sputum culture (n = 73,988)				
Positive	7,443 (10.06)	972 (13.06)	6,471 (86.94)	< 0.001
Negative	4,036 (5.45)	283 (7.01)	3,753 (92.99)	
Unperformed	2,466 (3.34)	255 (10.34)	2,211 (89.66)	
Unapplicable	60,043 (81.15)	7,769 (12.94)	52,274 (87.06)	
HIV (n = 74,005)				< 0.001
Positive	3,953 (5.34)	894 (22.62)	3,059 (77.38)	
Negative	26,233 (35.45)	2,447 (9.33)	23,786 (90.67)	
Ongoing	2,549 (3.44)	230 (9.02)	2,319 (90.98)	
Unperformed	41,270 (55.77)	5,709 (13.83)	35,561 (86.17)	

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Aids (n = 40,787)				< 0.001
Yes	3,428 (8.40)	786 (22.93)	2,642 (77.07)	
No	37,359 (91.60)	4,505 (12.06)	32,854 (87.94)	
Drinking status (n = 46,531)				< 0.001
Yes	9,414 (20.23)	1,893 (20.11)	7,521 (79.89)	
No	37,117 (79.77)	4,234 (11.41)	32,883 (88.59)	
Supervised treatment (n = 54,789)				< 0.001
Yes	33,630 (55.32)	3,976 (11.82)	29,654 (88.18)	
No	10,044 (26.39)	2,096 (13.06)	13,948 (86.94)	
Unreported	11,115 (18.29)	1,268 (11.41)	9,847 (88.59)	

Since all variables were shown to be statistically significant in the bivariate tests, they were inserted into the multivariate model which, by its turn, was adjusted for age (continuous), sex, and education. The non-significant variables of the initial model were removed one by one until a model composed only of the significant ones was achieved. In the final model, living in an urban zone was observed to increase the prevalence of treatment abandonment in 2.45 times (CI95%: 2.20 – 2.74) in relation to the rural zone. In addition, recurrent cases were observed to have an abandonment prevalence 22% higher than that of new cases (CI95%: 1.10 – 1.35) and 2.84 times higher among those classified as readmission after abandonment (2.68 – 3.01). On the other hand, for cases notified as transference, abandonment was 20% lower (CI95%: 0.69 – 0.92) (Table 3).

Nonetheless, the extrapulmonary form of the disease decreases the prevalence of this outcome by 20% (IC95%: 0.73 – 0.88). Concerning negative sputum smear, positive and unperformed sputum smear increased abandonment by 11% (CI95%: 1.03 – 1.19) and 30% (CI95%: 1.20 – 1.40), respectively. There was also a circa two times increase in the prevalence of abandonment when the HIV exam was positive (CI95%: 1.89 – 2.21) and of 77% when unperformed (CI95%: 1.64 – 1.90). Finally, being a drinker increased treatment abandonment by 50% (1.42 – 1.58) (Table 3).

Table 3 – Poisson robust regression model adjusted by age (continuous), sex, and education to estimate the prevalence ratio of factors associated to treatment abandonment, 2001-2017 – Fortaleza (CE), Brazil, 2018.

	Initial model	P	Final model	P
	PR (CI95%)		APR (CI95%)	
Living Area				
Rural	1	-	1	-
Urban	2.73 (2.34 – 3.18)	< 0.001	2.45 (2.20 – 2.74)	< 0.001
Peri-urban	1.66 (0.96 – 2.88)	0.070		
Type of admission				
New case	1	-	1	-
Recurrence	1.36 (0.99 – 1.30)	0.061	1.22 (1.10 – 1.35)	< 0.001
Post-abandonment readmittance	2.71 (2.51 – 2.93)	< 0.001	2.84 (2.68 – 3.01)	< 0.001
Transference	0.72 (0.59 – 0.87)	0.001	0.80 (0.69 – 0.92)	0.002
Disease form				
Pulmonary	1	-	1	-
Extrapulmonary	0.81 (0.72 – 0.92)	0.001	0.80 (0.73 – 0.88)	< 0.001
Mixed	1.09 (0.89 – 1.33)	0.393		
Sputum smear				
Negative	1	-	1	-
Positive	1.15 (1.05 – 1.26)	0.002	1.11 (1.03 – 1.19)	0.004
Unperformed	1.28 (1.15 – 1.42)	< 0.001	1.30 (1.20 – 1.40)	< 0.001

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	Initial model	P	Final model	P
	PR (CI95%)		APR (CI95%)	
Sputum culture				
Negative	1	-		
Positive	1.04 (0.94 – 1.15)	0.467		
Unperformed	1.04 (0.88 – 1.24)	0.642		
HIV				
Negative	1	-	1	-
Positive	2.26 (1.74 – 2.93)	< 0.001	2.04 (1.89 – 2.21)	< 0.001
Ongoing	1.14 (0.92 – 1.42)	0.242		
Unperformed	1.77 (1.64 – 1.90)	< 0.001	1.62 (1.53 – 1.71)	< 0.001
AIDS				
No	1	-		
Yes	1.03 (0.79 – 1.35)	0.838		
Drinker				
No	1	-	1	-
Yes	1.62 (1.50 – 1.75)	< 0.001	1.50 (1.42 – 1.58)	< 0.001
Supervised treatment				
No	1	-		
Yes	0.95 (0.88 – 1.03)	0.194		
Unreported	1.00 (0.83 – 1.21)	0.963		

DISCUSSION

This study has identified a high prevalence for the abandonment of TB treatment in the Brazilian state of Ceará. Living in urban areas, being readmitted after abandonment or reinfection and being HIV-positive are factors strongly related to this outcome. The same pattern was observed when the diagnostic exams of TB and HIV are not performed. However, drinking status was shown to be an important factor in the causal chain of treatment abandonment. On the other hand, the multivariate model has suggested a reduction in the prevalence of TB when the case was notified as transference and the disease manifested in the extrapulmonary form.

Urbanization is among the considered phenomena in the chain of TB outcomes, since when the geographic location is assessed, more populous regions and access to health services must be observed in greater detail[12]. Although this study has identified that living in urban areas increases the prevalence for TB treatment abandonment, the literature diverges regarding how much residency zone may influence treatment abandonment. Whereas a study performed in Nigeria[12] has identified that living in a rural area increases the chances of negative outcomes for TB (death, abandonment, and dysfunction), a Brazilian investigation[13] has identified no significant differences among living areas.

Concerning type of admission, recurrence and mainly readmission after abandonment may collaborate to a new abandonment. The literature reinforces these findings with studies conducted in South Africa[14], Brazil[15] and Ethiopia[16]. In this sense, it is fundamental that adherence strategies be conducted in the first treatment so as obtain a favorable outcome. There are many possibilities which can be used to avoid a new abandonment. One of them is directly observed therapy (DOT), which helps patients with regular medication intake, as well as alternatives to DOT, as observed through video[17-18]. Another important aspect is the active participation of the health team and the family[19-20].

The extrapulmonary form was identified in this research as a factor of reduction in treatment abandonment. Corroborating these findings, studies[21-23] have also identified the reduction of treatment abandonment when the non-pulmonary forms manifest. On the other hand, a study conducted in Pakistan[24] has found no significant association and an investigation developed in Malaysia[25] has pointed out an increase in unfavorable outcomes when the manifestation is extrapulmonary. However, it should be emphasized that, in addition to abandonment, the unfavorable category has encompassed other outcomes, such as death, transference, dysfunction and lack of assessment. Therefore, these results should be cautiously interpreted.

Another crucially important factor in TB treatment abandonment is its coinfection with HIV, considering the evidence of an increase of approximately twice the prevalence of this outcome when coinfection is observed. Similarly to what is observed in this investigation, research conducted worldwide points out an increase in the likelihood of

treatment abandonment when there is co-infection between the two diseases[12,21-23].

Brazil is among the countries listed by the WHO with the highest figures of TB-HIV co-infection[1]. This is even more relevant upon the estimates that, from 2002 to 2012, there was in increase from 9.52% to 13.60% in treatment abandonment by people with TB-HIV[26]. Thus, non-adherence to treatment by these people may be due to the need of an additional therapy which, by its turn, may lead to possible adverse effects. In addition, the literature raises the hypothesis that non-adherence may reflect the lack of a bond with the health professionals, who, in addition to physical matters, must also seek to understand the psychological issues of these patients[27].

Evidence was also provided for unperformed diagnostic tests both for TB and HIV, which may negatively influence the treatment. This important alert is due to the fact that this investigation has estimated an increase in the prevalence of abandonment when the status of HIV and TB are unknown. Thus, similarly to what is found in this investigation, studies also point out an increase in abandonment when HIV status is unknown[14,28]. This data shows the frailty of health services and in care of infectious diseases. Considering this, the need for intensifying policies for testing and case follow-up is emphasized, as well as the importance of knowing the serology status of HIV in individuals diagnosed with TB so that the treatment can be safely performed.

Finally, drug addiction is an essential factor in the causal chain for TB treatment abandonment, taking into account that this research has verified an increase in the prevalence of abandonment for drinkers. Studies conducted in Peru[28] and Brazil[23] suggest an increase in this outcome for drinkers and users of other drugs. Early identification of the use of alcohol and other drugs may lead to treatment adherence if the health team is duly trained to identify and implement DOT in this population[29].

The main limitation of this study concerns the use of a secondary database guided by the TB notification form, which changed in 2015. This change has precluded the use of many variables due to their high degree of incompleteness. However, the selected variables and the employed analyses were chosen to overcome this obstacle.

CONCLUSION

This study has observed that TB treatment abandonment is associated to many factors, which refer to living area (urban zone), disease (type of admission and disease form), health services (unperformed sputum smear and HIV exam) and health status (HIV positive, drinking status). These characteristics may subsidize intervention with the purpose of improving disease outcomes.

The investigated outcome must thus be understood as more than the factors discussed in this text, since it is complex and multifactorial. Upon comprehension of this chain of factors, health professionals and managers may recognize the epidemiological profile of a share of the Brazilian northeast population which deserves a focus of interventions to strengthen adherence to TB treatment. Therefore, the importance of public policies must be emphasized locally and nationally to modify the chain of disease transmission and eradicate treatment abandonment for this disease.

RESUMO

Objetivo: Estimar a prevalência de abandono do tratamento da tuberculose e seus fatores associados. **Método:** Estudo transversal que utilizou os casos de tuberculose do Sistema de Informação de Agravos de Notificação entre 2001 e 2017 no Ceará. Fizeram parte desse estudo 74.006 casos e o desfecho foi a situação de encerramento "abandono do tratamento". Foi realizada análise multivariada para estimar associação entre as variáveis com o abandono. **Resultados:** Durante todo o período, a taxa de abandono foi de 12,54%. Verificou-se maior prevalência de abandono entre as pessoas que residem na zona urbana (RP = 2,45; IC95%: 2,20-2,74), que dão entrada como reingresso pós-abandono (RP = 2,84; IC95%: 2,68-3,01), entre aqueles notificados como recidiva (RP = 1,22; IC95%: 1,10-1,35) e entre os etilistas (RP = 1,50; IC95%: 1,42-1,58). Aqueles que apresentaram baciloscopia de escarro positiva (RP = 1,11; IC95%: 1,03-1,19) ou não realizada (RP = 1,30; IC95%: 1,20-1,40), coinfecção (RP = 2,04; IC95%: 1,89-2,21) e que não realizaram sorologia (RP = 1,62; IC95%: 1,53-1,71) também possuem maior prevalência de abandono do tratamento para tuberculose. **Conclusão:** O abandono do tratamento da tuberculose está associado a fatores biológicos, sociais, hábitos e à estrutura dos serviços de saúde.

DESCRITORES

Tuberculose; Recusa do Paciente ao Tratamento; Epidemiologia; Estudos Transversais.

RESUMEN

Objetivo: Estimar la prevalencia del abandono del tratamiento de la tuberculosis y sus factores asociados. **Método:** Estudio transversal que utilizó los casos de tuberculosis del Sistema de Información de Agravios de Notificación entre 2001 y 2017 en Ceará, Brasil. Un total de 74.006 casos fueron incluidos en este estudio y el resultado fue la conclusión "abandono del tratamiento". Se realizó un análisis multivariante para estimar la asociación entre las variables con el abandono. **Resultados:** Durante todo el periodo, la tasa de abandono fue del 12,54%. Se encontró una mayor prevalencia de abandono entre las personas que viven en zonas urbanas (RP = 2,45; IC 95%: 2,20-2,74), los que ingresan como reingreso tras el abandono (RP = 2,84; IC95%: 2,68-3,01), los que se declararon reincidentes (RP = 1,22; IC95%: 1,10-1,35) y los alcohólicos (RP = 1,50; IC 95%: 1,42-1,58). Los que tenían una baciloscopia de esputo positiva (RP = 1,11; IC95%: 1,03-1,19) o para los cuales no se realizó baciloscopia de esputo (RP = 1,30; IC95%: 1,20-1,40), coinfección (RP = 2,04; IC95%: 1,89-2,21) y que no se sometieron a serología (RP = 1,62; IC95%: 1,53-1,71) también presentaron una mayor prevalencia de abandono del tratamiento de la tuberculosis. **Conclusión:** El abandono del tratamiento de la tuberculosis está asociado a factores biológicos y sociales, a los hábitos y a la estructura de los servicios sanitarios.

DESCRIPTORES

Tuberculosis; Negativa del Paciente al Tratamiento; Epidemiología; Estudios Transversales.

REFERENCES

1. World Health Organization. Global tuberculosis report 2020 [Internet]. Geneva: World Health Organization; 2020 [cited 2020 Dec 7]. Available from: https://www.who.int/teams/global-tuberculosis-programme/tb-reports
2. Brasil. Ministério da Saúde. Boletim Epidemiológico. Tuberculose 2020 [Internet]. Brasília, DF: Ministério da Saúde; 2020 [cited 2020 Dec 7]. Available from: https://antigo.saude.gov.br/images/pdf/2020/marco/24/Boletim-tuberculose-2020-marcas--1-.pdf
3. Ceará. Secretaria de Saúde. Boletim epidemiológico da tuberculose [Internet]. Fortaleza: Secretaria de Saúde; 2020 [cited 2020 Dec 7]. Available from: https://www.saude.ce.gov.br/wp-content/uploads/sites/9/2018/06/boletim_tuberculose_02_10_2020.pdf
4. Beraldo AA, Andrade RL, Orfão NH, Silva-Sobrinho RA, Pinto ES, Wysocki AD, et al. Adherence to tuberculosis treatment in Primary Health Care: perception of patients and professionals in a large municipality. Esc Anna Nery. 2017;21(4):e20170075. https://doi.org/10.1590/2177-9465-ean-2017-0075
5. Arakawa T, Magnabosco GT, Andrade RL, Brunello ME, Monroe AA, Ruffino-Netto A, et al. Tuberculosis control program in the municipal context: performance evaluation. Rev Saude Publica. 2017;51:23. https://doi.org/10.1590/s1518-8787.2017051006553
6. Lima LM, Harter J, Tomberg JO, Vieira DA, Antunes ML, Cardozo-Gonzales RI. Monitoring and assessment of outcome in cases of tuberculosis in a municipality of Southern Brazil. Rev Gaúcha Enferm. 2016;37(1):e51467. https://doi.org/10.1590/1983-1447.2016.01.51467
7. Furlan MC, Marcon SS. [Evaluation of access to tuberculosis treatment from the point of view of patients]. Cad Saude Colet. 2017;25(3):339-47. Portuguese. https://doi.org/10.1590/1414-462x201700030139
8. Putera I, Pakasi TA, Karyadi E. Knowledge and perception of tuberculosis and the risk to become treatment default among newly diagnosed pulmonary tuberculosis patients treated in primary health care, East Nusa Tenggara: a retrospective study. BMC Res Notes. 2015;8(1):238. https://doi.org/10.1186/s13104-015-1209-6
9. Instituto Brasileiro de Geografia e Estatística. Brasil - Ceará [Internet]. Rio de Janerio: Instituto Brasileiro de Geografia e Estatística; 2020 [cited 2020Jun 12]. Available from: https://cidades.ibge.gov.br/brasil/ce/panorama
10. Brasil. Ministério da Saúde. Manual de recomendações para o controle da tuberculose no Brasil [Internet]. Brasília, DF: Ministério da Saúde; 2019 [cited 2020 jun.Jun 15]. Available from: http://bvsms.saude.gov.br/bvs/publicacoes/manual_recomendacoes_controle_tuberculose_brasil_2_ed.pdf
11. Coutinho LM, Scazufca M, Menezes PR. Methods for estimating prevalence ratios in cross-sectional studies. Rev Saude Publica. 2008;42(6):992-8. https://doi.org/10.1590/S0034-89102008000600003
12. Adamu AL, Aliyu MH, Galadanci NA, Musa BM, Lawan UM, Bashir U, et al. The impact of rural residence and HIV infection on poor tuberculosis treatment outcomes in a large urban hospital: a retrospective cohort analysis. Int J Equity Health. 2018;17(1):4. https://doi.org/10.1186/s12939-017-0714-8
13. Basta PC, Marques M, Oliveira RL, Cunha EA, Resendes AP, Souza-Santos R. Social inequalities and tuberculosis: an analysis by race/color in Mato Grosso do Sul, Brazil. Rev Saude Publica. 2013;47(5):854-64. https://doi.org/10.1590/S0034-8910.2013047004628
14. Kigozi G, Heunis C, Chikobvu P, Botha S, Rensburg D. Factors influencing treatment default among tuberculosis patients in a high burden province of South Africa. Int J Infect Dis. 2017;54:95-102. https://doi.org/10.1016/j.ijid.2016.11.407
15. Silva EA, Anjos UU, Nogueira JA. [Predictive model to the tuberculosis treatment abandonment]. Saúde Debate. 2014;38(101):200-9. Portuguese. https://doi.org/10.5935/0103-1104.20140018
16. Tesfahuneygn G, Medhin G, Legesse M. Adherence to Anti-tuberculosis treatment and treatment outcomes among tuberculosis patients in Alamata District, northeast Ethiopia. BMC Res Notes. 2015;8(1):503. https://doi.org/10.1186/s13104-015-1452-x
17. Alipanah N, Jarlsberg L, Miller C, Linh NN, Falzon D, Jaramillo E, et al. Adherence interventions and outcomes of tuberculosis treatment: a systematic review and meta-analysis of trials and observational studies. PLoS Med. 2018;15(7):e1002595. https://doi.org/10.1371/journal.pmed.1002595
18. Müller AM, Osório CS, Silva DR, Sbruzzi G, de Tarso P, Dalcin R. Interventions to improve adherence to tuberculosis treatment: systematic review and meta-analysis. Int J Tuberc Lung Dis. 2018;22(7):731-40. https://doi.org/10.5588/ijtld.17.0596
19. Oliveira RA, Lefèvre F. Communication on disclosure of tuberculosis diagnosis and adherence to treatment: social representations of professionals and patients. Texto Contexto Enferm. 2017;26(2):e06790015. https://doi.org/10.1590/0104-07072017006790015
20. Chirinos NE, Meirelles BH, Bousfield ABS. Social representations of TB patients on treatment discontinuation. Rev Gaúcha Enferm. 2015;36(spe):207-14. https://doi.org/10.1590/1983-1447.2015.esp.56723
21. Harling G, Lima Neto AS, Sousa GS, Machado MM, Castro MC. Determinants of tuberculosis transmission and treatment abandonment in Fortaleza, Brazil. BMC Public Health. 2017;17(1):508. https://doi.org/10.1186/s12889-017-4435-0
22. Snyder RE, Marlow MA, Phuphanich ME, Riley LW, Maciel EL. Risk factors for differential outcome following directly observed treatment (DOT) of slum and non-slum tuberculosis patients: a retrospective cohort study. BMC Infect Dis. 2016;16(1):494. https://doi.org/10.1186/s12879-016-1835-1
23. Prado TN, Rajan JV, Miranda AE, Dias ED, Cosme LB, Possuelo LG, et al. Clinical and epidemiological characteristics associated with unfavorable tuberculosis treatment outcomes in TB-HIV co-infected patients in Brazil: a hierarchical polytomous analysis. Braz J Infect Dis. 2017;21(2):162-70. https://doi.org/10.1016/j.bjid.2016.11.006
24. Chida N, Ansari Z, Hussain H, Jaswal M, Symes S, Khan AJ, et al. Determinants of default from tuberculosis treatment among patients with drug-susceptible tuberculosis in Karachi, Pakistan: a mixed methods study. PLoS One. 2015;10(11):e0142384. https://doi.org/10.1371/journal.pone.0142384
25. Liew SM, Khoo EM, Ho BK, Lee YK, Mimi O, Fazlina MY, et al. Tuberculosis in Malaysia: predictors of treatment outcomes in a national registry. Int J Tuberc Lung Dis. 2015;19(7):764-71. https://doi.org/10.5588/ijtld.14.0767

26. Gaspar RS, Nunes N, Nunes M, Rodrigues VP. Temporal analysis of reported cases of tuberculosis and of tuberculosis-HIV co-infection in Brazil between 2002 and 2012. J Bras Pneumol. 2016;42(6):416-22. https://doi.org/10.1590/s1806-37562016000000054

27. Magnabosco GT, Andrade RL, Arakawa T, Monroe AA, Villa TC. Tuberculosis cases outcome in people with HIV: intervention subsidies. Acta Paul Enferm. 2019;32(5):554-63. https://doi.org/10.1590/1982-0194201900077

28. Lackey B, Seas C, Van der Stuyft P, Otero L. Patient characteristics associated with tuberculosis treatment default: a cohort study in a high-incidence area of Lima, Peru. PLoS One. 2015;10(6):e0128541. https://doi.org/10.1371/journal.pone.0128541

29. Silva MR, Pereira JC, Costa RR, Dias JA, Guimarães MD, Leite IC. Drug addiction and alcoholism as predictors for tuberculosis treatment default in Brazil: a prospective cohort study. Epidemiol Infect. 2017;145(16):3516-24. https://doi.org/10.1017/S0950268817002631

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