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Research Article

Profile of Adherence to Treatment of Latent Tuberculosis Infection in users Treated in a Location in the city of Salvador, Bahia, Brazil

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Abstract:

Introduction: The high prevalence and incidence of LTBI in the world means that the disease has not yet been eradicated. Even though the treatment is already consolidated, few studies on drug adherence in LTBI have been developed. This study investigates adherence to pharmacological treatment of LTBI in users treated at health units in a location in Salvador, Bahia, Brazil.

Methods: observational cross-sectional study, using a sociodemographic and clinical questionnaire and an adapted Morisky -Green adherence test.

Results: 34 patients with LTBI participated. The majority of users adhere to pharmacotherapy (82.4%; N=24). And a small number are few adherents 17.6% (N=6). No non-compliant users were found. Adherence to LTBI treatment is related to selected sociodemographic and clinical variables: appearance of ADRs (p =0.031); difficulties in taking medications (p=0.020); and participation in tuberculosis groups (p =0.043).

Conclusion: there is a need to better conduct LTBI treatment in the Salvador Railway Suburb. F uture research is valid to deepen this study. A protocol and/or flow is suggested to promote adherence of people with LTBI.

Key words: adherence to treatment; latent tuberculosis infection; user; health unic system; primary health care

Introduction

Fighting diseases such as tuberculosis (TB) is essential worldwide. It is a prevalent disease in many poor, developing and even developed countries [1]. The repercussions of this disease affect everything from the economy to sociocultural aspects. Hence the focus of all countries on eliminating the disease once and for all [2]. In 2020 alone, TB affected around 9.9 million people worldwide, being responsible for 1.3 million HIV deaths [3].

Bahia presented 3,861 LTBI treatment notifications in 2021, ranking 6th. place among Brazilian states in number of cases, and 19th. place in incidence rate [4, 5]. Salvador in 2021 had 1,331 active cases of TB, with an incidence of 46.1/100 thousand inhabitants. Of these, 46.1 were deaths, with the mortality rate due to TB/100 thousand inhabitants being 3.5% [5]. These data highlight the relevance of this study, amplify the need to control the disease and reaffirm tuberculosis as a challenge to global public health [6, 7].

Latent tuberculosis infection, or simply LTBI, should not be confused with active tuberculosis. This is because in LTBI the user has the bacillus without, however, developing the active form of the disease [4]. LTBI is equivalent to the period between the introduction of Mycobcterium tuberculosis into the human body and the subsequent emergence of active TB [8, 9]. Symptoms do not always appear, due to the course of the disease itself and the characteristics inherent to each individual [10].

Its contagion and transmission occurs through the inhalation of suspended particles containing the bacillus in the air, mainly through the air. There are reports of immunocompetent individuals living with the infection, despite remaining, over the years, without disseminating the bacillus [11, 12].

LTBI treatment takes place in a context, in which the user must be monitored and monitored monthly, to provide better adherence and eliminate the infection. In Brazil, three therapeutic regimens are recommended for the treatment of LTBI: Isoniazid, Rifampicin and the combination of Rifapentine and Isoniazid [13].

Adherence to medication use has been investigated and debated in the scientific literature by several scholars. The accession process

encompasses a plurality of factors [14]. Determining adherence is a parameter that helps identify non-adherent individuals and identify difficulties in adhering to medication, being a multidimensional phenomenon [15, 16].

The study aimed to understand adherence to pharmacological treatment for LTBI in users treated at health units in a location in Salvador, Bahia, known as Subúrbio Ferroviário.

Methods

The study was observational, cross-sectional , with the purpose of studying adherence to pharmacological treatment of users with LTBI, using a sociodemographic and clinical questionnaire and the Morisky , Green and Levine adherence test [14]. The study population consisted of users with LTBI who were monitored in health units in the Salvador Railway Suburb. The patients participated in the study voluntarily, after signing the informed consent form (ICF) . The study population considered was made up of individuals undergoing LTBI treatment during a period of seven months (March/2023 to September/2023). The sample selection was for convenience.

To participate in the study, the user must be an adult of both sexes, diagnosed with LTBI, be using medications to treat LTBI, be able to understand, verbalize and answer questions and agree to participate in the study, be registered at the health care unit. health care where you are undergoing treatment, live in the municipality of Salvador.

Users with cognitive difficulties in understanding the study, with any acute or chronic condition that limits the ability to participate in the study and refusal to participate in the research of their own free will were excluded.

Participants were interviewed from March to September 2023. The occasions were the first consultation and the segments, through return visits. The interview was composed of four blocks: a) sociodemographic characteristics of the user, b) clinical characteristics and c) adherence measurement test by Morisky , Green and Levine [14] .A database was created using SPSS ® SoftwareStatistics version 29.0.1 . The following steps were completed: a) questionnaire application; b) descriptive statistics; **c)** Morisky , Green and Levine adhesion test and d)This is Chi -Square.

Regarding the adapted Morisky -Green adherence test , Delgado and Lima validated the adherence instrument developed by Morisky , Green and Levine, verifying the responses on the Likert scale with the scores: always (0), almost always (1), frequently (2), sometimes (3), rarely (4) and never (5) [14,15]. This scale is widely used and validated as a method to characterize medication adherence [16,17,18].

In table 1, items (questions) 1, 2, 3 and 4 of the test were adapted from Morisky, Green and Levine, item 6 (question) was adapted from Ramalhinho[18,19]. Item 7 was adapted from Shea et al [20].

1- Do you sometimes forget to take your medication?						
2- Are you sometimes careless about when to take your medication?						
3- When you feel well, do you sometimes stop taking your medication?						
4- Have you ever stopped taking your medication on your own initiative, after feeling worse?						
5- Have you ever taken one or more pills on your own initiative, after feeling worse?						
6- Have you ever interrupted your treatment because you ran out of medication?						
7- Have you ever stopped taking your medication for any reason other than your doctor's advice?						
Ever Value = 0	**Almost always Value = 1**	**Frequently Value = 2**	**Sometimes Value = 3**	**Rarely Value = 4**	**Never Value = 5**	**Total of points = 35**

Table 1: Morisky -Green adhesion test adapted in 2023.

Source: Morisky , Green and Levine (1986) adapted, 2022.

Each of the answers to the seven questions contained in the test was assigned a value of 0 to 5 points. The value of each test question is added together. This generates a total score scale that can vary between 0 and 35 for each user. The higher the score, the more adherent the user is, otherwise, the less adherent he is (table 1).

Users with a total score of 35 or close to this value were considered more adherent, users with scores from 0 to 11 were considered non-adherent and those between 12 and 22 as less or moderately adherent (table 2).

Morisky -Green test	User rating regarding membership
23.0 to 35.00 points	More grippy
12.0 to 22.0 points	Less adherent (moderate)
0 to 11.0 points	Non-adherent

Table 2: Scoring scale for classifying users according to the adapted Morisky -Green test**.**

Source: Morisky, Green and Levine (1986) adapted, 2022.

Results

It can be seen that, in relation to sex at birth, 58.8% (N=20) were male, while 38.2% (N=13) were female. Only 1 (2.9%) prefer not to say. Ages ranged from 23 to 71 years, with the average age being 45.3 years and the median being 43.5 years. The majority of users were aged 40 or over, representing 70.6% (N=24) of the sample. The ages of 38 and 42 were the most common in the sample studied.

The prevailing sexual orientation was heterosexual (94.1%, N=32). The stable union was predominant (29.4%, N=10) compared to the others. Monthly income of R$ 1,302.00 to R$2,604.00 (44.1%; N=15) was the most frequent. Regarding the level of education, completing secondary education (38.2%, N=13) was recurrent. It was found that there is a lack

of knowledge about LTBI (64.7%, N=22). As for the color/race that the user recognizes, the majority (44.1%, N=15) declared themselves black.

Regarding religion, the majority identified themselves as evangelical (38.2%, N=13). Pregnant users represent 5.8%, N=2. The vast majority (88.2%, N=30) do not live alone. It can be seen that 26.4% (N=9) of them live with at least 4 people or more. With regard to the use of substances that enhance or constitute risk factors for developing LTBI, 50% (N=17), half use at least alcohol 38.2% (N=13) or cigarettes 11.8% (N =4). Also, 23.5% (N=8) use other substances that contribute to the risk of developing LTBI, but for ethical and confidentiality reasons they were not mentioned. The number of users who do not use any substance with the potential to increase the risk of developing LTBI was 26.5% (N=9).

It is noted that trader and salesperson activities were more frequent, together representing 17.6% (N=6). Other occupations that have contact with the public also appeared in the study, such as janitor, security guard, sweeper, attendant, storekeeper, driver, receptionist and nursing technician. The majority of users, represented by 47.1% (N=16) of the sample, cannot say whether they had contact with a TB patient, while 35.3% (N=12) said they had contact with a person with the disease.

It was observed that 67.6% (N=23) of the people studied did not know how close they were to the person who had tuberculosis. However, brother and friend, together, were responsible for 17.6% (N=6) of contacts with tuberculosis patients (table 2). Most users weighed between 60kg and 80kg, a few users weighed between 30kg and 60kg. Regarding the users' BMI, there was a percentage of 17.7% (N=6) of users who were underweight, with 2 users being severely underweight and 4 users being underweight.

Table 1 below contains the most common adverse reactions presented by users of the sample studied. It is noteworthy that the same adverse reaction was also triggered by several users.

Reaction name	Frequency of users with the reaction
Nausea	44.1%
Vomiting	26.5%
Diarrhea	20.6%
Abdominal pain	14.7%
Tingling or numbness in the hands, feet, legs and arms	11.8%
General malaise and malaise	23.5%
Red spots on the skin	17.6%
Red discoloration of sweat, urine or tears	61.8%
Headaches	5.9%
No reaction	23.5%

Table 1: Frequency of adverse reactions with the use of medication(s) for LTBI in users treated in the Subúrbio Ferroviário location between the months of March to September 2023.

Source : Data collected by the author himself, 2024.

Table 2 shows the results of the adapted Morisky -Green test, which classifies users into adherent and less adherent. It is stated that part of the users (82.4%; N=24) were considered compliant, through the test. Therefore, the number of adherents to pharmacotherapy in LTBI was relevant when compared to the percentage of few (moderate) adherents (17.6%; N=6).

LTBI pharmacotherapy adherence groups	Frequency	Percentage (%)	Group
Non-adherents	0	0	1
Less adherent (moderate)	6	17.6	two
Adherents	28	82.4	3
Total	34	100.0	

Table 2: Classification in groups of adherence to ILTB pharmacotherapy according to the Morisky -Green scale of users treated in the Subúrbio Ferroviário location between the months of March to September 2023.

Source : Data collected by the author himself, 2024.

In order to evaluate the behavior of adherence to LTBI treatment for this study, given the users' sociodemographic and clinical variables, based on the result of the adapted Morisky -Green scale, the Chi -Square test was carried out for each group. identified by the aforementioned scale: adherent and poorly adherent. The variable degree of adherence to LTBI treatment was compared with sociodemographic and clinical variables to verify the association. The choice of sociodemographic and clinical variables addressed to compose the Chi -Square test were those most cited in the literature, as they supposedly influence medication adherence [21,22, 23, 24, 25].

According to the results of the Chi -Square test in table 3, participation in tuberculosis groups in the units, the difficulties encountered in withdrawing medications for LTBI, as well as adverse drug reactions (ADRs) for LTBI are associated, in a statistically significant way ($p < 0,05$), with the degree of adherence to pharmacological treatment for LTBI.

Variables	Adherents N (%)	Less adherent N (%)	P
Age Ranges			
Up to 38 years	9	1	0.415
Between 39 and 44 years old	8	0	
Between 45 and 54 years old	6	3	
Over 54 years old	5	two	
Sex			

Masculine	14	6	0.081
Feminine	13	0	
Prefer not to say	1	0	
Education			
No instruction	two	0	0.710
Incomplete elementary education	7	1	
Complete primary education	0	0	
Incomplete high school	two	1	
Complete high school	10	3	
Incomplete higher education	two	1	
Complete higher education	4	0	
Don't know how to inform	1	0	
Substance use			
Cigarette	4	0	0.919
Alcohol	11	two	
Others	8	1	
Does not use	5	3	
Practice of physical activity			
Yes	18	two	0.267
No	10	4	
Body Mass Index (BMI)			
Normal	13	3	0.347
Obese	3	1	
Overweight	7	1	
Underweight	3	1	
Severe Underweight	two	0	
Participation in tuberculosis groups*			
Yes	10	two	0.043
No	9	0	
There are no groups in the health unit	9	4	
Difficulties in withdrawing medication for LTBI*			
Missing medicine at the health unit	1	0	0.020
Recipe in just one copy	3	1	
Unreadable recipe	two	0	
Incomplete recipe	1	0	
Scratched recipe	two	0	
Lack/absence of pharmacy professional	two	3	
Health unit closed	3	0	
Never had difficulty removing the medication(s)	14	two	
Use of other medications to treat LTBI symptoms			
Yes	11	two	0.589
No	17	4	
Presence of chronic diseases			
Yes	4	15	0.471
No	13	two	
Drug reactions for LTBI*			
Yes	20	6	0.031
No	8	0	
How to use the medicine for LTBI			
1x a day	14	3	0.736
2x a day	3	1	
3x a day	0	0	
1x per week	11	two	
Risk factors for LTBI			
Smoking	8	1	0.868
Use of illicit drugs	1	0	
Alcohol abuse	4	0	
Diabetes	4	1	
None of these	11	4	

Source : Data collected by the author himself, 2024.

Table 3: Profile of adherence to LTBI treatment (Morisky -Green test) in relation to socioeconomic and clinical variables of users treated in the Subúrbio Ferroviário location between the months of March to September 2023.

Discussion

Some factors may have contributed to the results indicated. The presence of TB programs within the units seems to positively favor user adherence, as long as they participate. Certainly, the presence of educational groups is relevant for users to perceive LTBI as a disease that, despite being silent, in some cases, requires treatment. It is noteworthy that there were no non-adherent users in the sample for this study. The results show that there are few obstacles to the adherence of users in the sample to LTBI treatment. This can be proven by the small number of adherents (N=6).

The presence of few adherents to pharmacotherapy against LTBI in this research can be explained by events that are beyond the users' control. The lack of medication for LTBI can be seen as an aggravating factor, as users reported some type of problem related to the lack of medication(s) on the date to pick them up.

Special attention should be given to polypharmacy users, especially in relation to the impact on LTBI treatment. It is important to highlight that 38.3% (N=13) of them, in addition to using medications to treat LTBI, use other drugs to alleviate possible symptoms of the disease. In this study, prescriptions for ferrous sulfate, complex B, dipyrone, omeprazole, paracetamol, folic acid, among others, were identified.

The presence of chronic diseases may also be linked to the adherence profile presented in this study. Diseases such as diabetes, bronchitis, obesity, hypertension, rhinitis, among others present in the users of this study, had an impact on adherence to LTBI treatment, especially as an effect on its reduction. Therefore, it could most likely be interfering with the adherence profile identified in this study.

In this study, it was noted that adherence is closely related to adverse reactions to LTBI medications. Among the most common and mentioned by users are reddish urine, nausea, vomiting and diarrhea. Many authors have already reported problems with adherence due to the appearance of adverse reactions [26, 27]. Some studies indicate that no difference in the frequency of ADRs has been reported with intermittent or daily intake of antituberculous medications [26].

When checking the degree of adherence to LTBI pharmacological treatment, using the adapted Morisky -Green scale, most users are adherent, but there are a number of users classified as low or moderate adherent. Given that the reasons why users presented themselves as not very compliant with pharmacotherapy, the following could possibly be pointed out: the appearance of ADRs and the difficulties in taking medications from health units. Participation in TB programs can be favorable to greater adherence among study users.

However, it can be stated that the sociodemographic and clinical variables in this study have some relationship with adherence to LTBI treatment in the Railway Suburb of Salvador, serving as a measure to prevent active TB, as it prevents susceptible users infected with the bacillus from progressing to severe forms of the disease, thus controlling the transmission cycle.

Conclusion

The work explored the profile of adherence to pharmacological treatment of LTBI in users in health units in a location in the city of Salvador, Bahia . It also made it possible to expand knowledge about adherence to LTBI treatment, as well as the provision of the tuberculosis program within the SUS and the panorama of treatment of this disease, under its clinical and sociodemographic aspects, by characterizing access to care, pharmacological therapy.

Finally, given the research objectives, it can be concluded that adherence to LTBI treatment, for this study, is related to the behavior of sociodemographic and clinical variables: participation in tuberculosis groups, the presence of ADRs and difficulties in withdrawing medications from health units, as these were significant in the approach taken by the Chi -square test.

In this context, adherence to treatment may indicate the need for adjustments to manage the disease, guiding all health professionals, and even public managers, for future recommendations and interventions in the treatment of the disease.

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