Original Article

The effectiveness of the Family Health Strategy and the Directly Observed Treatment in Tuberculosis control

A eficácia da Estratégia Saúde da Família e do Tratamento Diretamente Observado no controle da Tuberculose

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RESUMO
Justificativa e objetivos: O fortalecimento da Atenção Básica à Saúde, tornando-a protagonista no cuidado da pessoa com tuberculose (TB), favorece a identificação de sintomáticos respiratórios, assim como o diagnóstico e tratamento precoce, diminuindo a transmissão da doença e favorecendo a adesão ao tratamento. Este estudo procurou investigar a eficácia da cobertura da Estratégia Saúde da Família (ESF) e da estratégia de Tratamento Diretamente Observado (TDO) no controle do abandono de tratamento para TB. **Métodos**: Estudo exploratório, a partir de dados secundários. As variáveis investigadas foram: coeficiente de incidência de tuberculose (CI-TB), percentual de cobertura por ESF, percentual de abandono de tratamento e percentual de oferta de TDO, no Mato Grosso do Sul. Foi utilizada a análise de agrupamento por método hierárquico para buscar padrões contidos no conjunto de dados. **Resultados:** Os dados obtidos indicam que há grupos de municípios em que nos quais a cobertura por ESF e TDO contribuem para adesão ao tratamento e para o controle do número de casos de TB. Em outro grupo de enquanto que para outros municípios, estas medidas não têm sido eficazes na redução do CI-TB, nem na redução dos índices de abandono ao tratamento. A TB se distribui de forma heterogênea em Mato Grosso do Sul. **Conclusão:** Profissionais e gestores da saúde precisam conhecer os padrões da tuberculose, em suas regiões, priorizando e planejando ações que contribuam para um efetivo controle da transmissão da doença e maior adesão ao tratamento em sua comunidade.
DESCRITORES: Tuberculose. Terapia Diretamente Observada. Estratégia de Saúde da Família. Adesão ao tratamento

ABSTRACT
Background and objectives: The consolidation of Primary Health Care, making it the leading role in the care of the individual with tuberculosis, favors the identification of respiratory symptoms, as well as the diagnosis and early treatment, reducing disease

transmission and promoting treatment adherence. This study aimed to investigate the effectiveness of the Family Health Strategy – FHS – coverage and the Directly Observed Treatment Strategy – DOTS in the control of non-adherence to tuberculosis treatment. **Methods:** Exploratory study, based on secondary data. The investigated variables were: TB incidence rate (CI-TB), percentage of coverage by the FHS, treatment abandonment rate and percentage of DOTS offered in the state of Mato Grosso do Sul. The hierarchical cluster analysis method was used to look for patterns contained in the data set. **Results:** The data indicate that there are groups of municipalities in which the coverage by FHS and DOTS contributes to treatment adherence and control of the number of TB cases, while in other municipalities these measures have not been effective in reducing CI-TB and treatment abandonment rate. The disease is heterogeneously distributed in the state. **Conclusion:** Professionals and health managers need to be aware of TB patterns in their regions, prioritizing and planning actions that contribute to an effective control of the disease transmission, and to greater treatment adherence in their community.

DESCRIPTORS: Tuberculosis. Directly Observed Treatment. Family Health Strategy. Treatment adherence.

INTRODUÇÃO

Brazil is one of the 22 countries that account for 80% of the global tuberculosis (TB) burden, ranking 18th worldwide in new cases and 22nd in TB incidence coefficient (IC). In the year 2015 it was observed that the North, Southeast and Northeast regions showed the highest indexes of new cases of the disease, being respectively 37.4, 34.1 and 28.9/100,000 inhabitants. The Midwest region had an IC of 19.7/100,000, Mato Grosso do Sul state of showed an IC of 28.4/100,000, and a treatment abandonment rate of 8.8% for new cases with laboratory confirmation.[1]

Health professionals, aiming to interrupt Mycobacterium tuberculosis transmission cycle and prevent the emergence of resistant strains, as well as disease recurrence, should stimulate adherence to TB therapeutic treatment. For the World Health Organization (WHO), there is compliance when the behavior of a person, regarding the proposed therapeutic regimen, coincides with a health professional's recommendations.[2]

It is considered treatment abandonment, when the patient stops coming to the health unit for more than thirty consecutive days, after the last date established for consultation, from the beginning of treatment; this behavior has a variability that ranges from the total refusal to use, or irregular use of drugs, until non-compliance with treatment for the prescribed time.[3]

The recommended therapy for TB treatment is a relatively long treatment using four drugs (Rifampicin - R, Isoniazid – H, Pyrazinamide - Z and Ethambutol - E) during the first

two months of treatment and continuation of RH for more 4 months; these drugs often cause adverse reactions, which may be related to treatment abandonment. [4]

Individuals who started the treatment after recurrence or who had previously discontinued treatment are more likely to abandon treatment within 6 months after the start of therapy. [5] In a study of the reasons for abandoning TB treatment, the authors found that the fear of losing one's job, the need to prioritize subsistence, difficulty in having access to health services and the lack of time to go to the health unit to receive the medications are the main factors. [6]

One of the strategies recommended by the WHO and the Ministry of Health for the disease control is the use of the Directly Observed Treatment strategy (DOTS), which consists in observing medication intake, preferably every day, to improve patient adherence to the treatment and to prevent the emergence of drug-resistant strains. [7]

The strengthening of the Primary Health Care, making it the leading role in the care of the individual with TB allows the health team to establish a closer contact with the patients and their acquaintances, which makes it possible to identify symptomatic respiratory patients and, consequently, to diagnose and treat them, thus reducing the transmission of the disease bacillus and favoring adherence to treatment, since TB treatment abandonment contributes to the maintenance of the transmission chain and the emergence of multidrug-resistant TB, which constitutes a challenge to public health. [3,6,8]

Considering that adherence to treatment is essential from the beginning to the end of the therapy, as its irregularity impairs the disease prognosis, this study aimed to investigate the effectiveness of the Family Health Strategy coverage and the use of DOTS in the control of TB treatment abandonment and fight against the disease in the municipalities that had new TB cases notified in the year 2012, in the state of Mato Grosso do Sul (MS), Brazil.

METHODS

This is an exploratory, ecological study using secondary data obtained from the Ministry of Health database – Datasus – and the State Secretariat of Health of Mato Grosso do Sul (SES/MS).

The state of Mato Grosso do Sul has 79 municipalities. Data from 66 municipalities were included, since 13 municipalities did not register new TB cases in 2012. Data from the

municipality of Paraíso das Águas were not included either, as the municipality was created in 2013.

The assessed variables were: CI-TB, percentage of coverage by FHT, percentage of treatment abandonment and percent of DOTS offer in the year of 2012, as it was the only year for which information on DOTS offer was available in the website of SES/MS. [9]

After variable standardization (null mean and unit variance), the group analysis was processed through the hierarchical method aiming to group the similar municipalities according to their characteristics. This technique allows the simultaneous analysis of multiple measures of each assessed variable.[10] The Euclidean distance was used to measure the similarity between the municipalities and Ward's method was used as a method to connect the groups; then the mean of the variables was calculated to compare the characteristics of each group.[10] Subsequently, geoprocessing techniques allowed the visualization of the group structure found through a thematic map. The processing of the group analysis was carried out using the Statistica software, version 7.0, by Statasoft[™] and the Terra View 4.2.2[™] software was used to compile the thematic map.

RESULTS

The group structure contained in the initial set of data can be seen in the dendrogram depicted in Figure 1. The division into seven groups of municipalities (G1 to G7) was adopted, as it has characteristics of managerial, administrative, and public health practice interest.

Table 1 shows the means of the variables obtained in each group; it shows that G2 included 12 municipalities with the lowest percentage of FHS coverage (60%); the two municipalities grouped in G3 did not offer DOTS (0.0%), had an abandonment rate of 100%, and also the lowest CI-TB (11.7 cases / 100,000); G5 included the group of five municipalities with the highest CI-TB (125.8 cases/100,000); G6 included the group that comprised nine municipalities with the highest FHS coverage (97.9%) and G7 included nine municipalities with the highest offer of DOTS (100%) and the lowest percentage of treatment abandonment (0.4%).

Table 1- Distribution of groups of municipalities, according to the averages obtained by grouping, Mato Grosso do Sul-MS, Brazil.

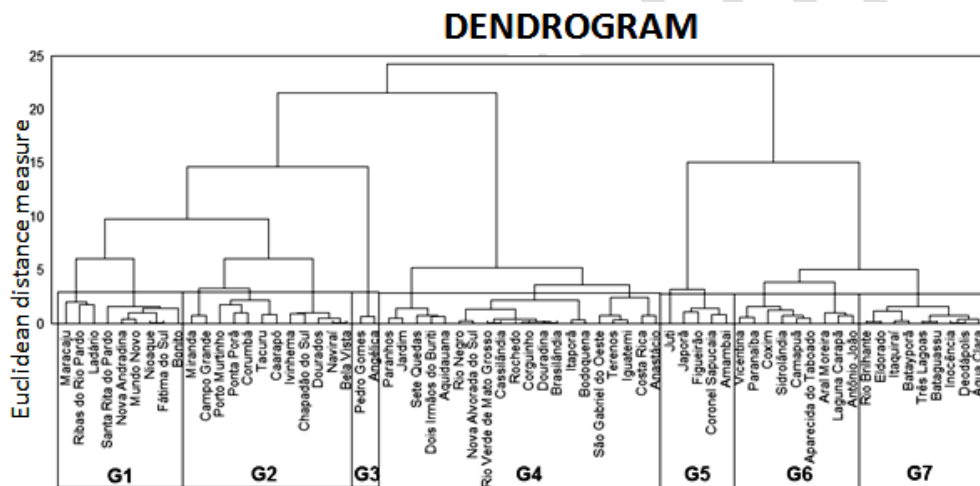|	CI-TB	DOTS	Abandonment	FHS
Grouping		%	%	%
G1 (09)	24.2	5.6	16.3	67.6
G2 (12)	40.4	79.4	3.6	60
G3 (02)	11.7	0.0	100	96.7
G4 (20)	30.6	8.3	3.4	96.7
G5 (05)	125.8	80	0.8	89.4
G6 (09)	44.9	96.3	18.3	97.9
G7 (09)	30.4	100	0.4	97.3

Figure 1: Dendrogram showing the structure of groups of municipalities in Mato Grosso do Sul, Brazil.

The thematic map (figure 2) shows that municipalities with similar characteristics are heterogeneously distributed in the state.
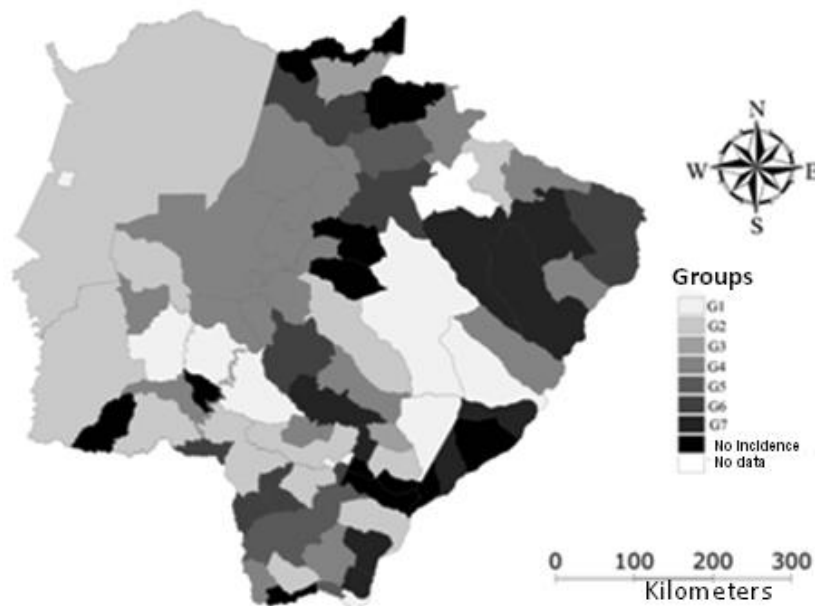
Figure 2 – Thematic map showing the distribution of municipalities according to the structure of groups obtained by grouping analysis through the hierarchical method.

DISCUSSION

The use of secondary data in this study is a limiting factor concerning results, considering that they represent population averages, as this is an ecological study; however, it is important to know the different realities, aiming to achieve better disease control. It has been verified that, for some municipalities, the FHS and/or the offer of DOTS contributes to treatment adherence and control of the number of TB cases, but for others these strategies have not been successful.

The incidence of TB cases in the year 2012 in MS was 37.7 /100,000 inhabitants.[11] The municipalities grouped in G1, G3, G4 and G7 had a mean incidence of 24.2 cases/100,000 inhabitants, less than the mean incidence of the state. The G2 and G6 municipalities had a mean incidence >40 cases/100,000 inhabitants, which is higher than the mean incidence of TB in the state. These data are similar to the incidence of TB in the state of Pernambuco (43.6/100,000 inhabitants) in the same year. [1]

Among the municipalities grouped in G5, TB incidence rate was high, being >100 cases/100,000 inhabitants. Four of the five municipalities grouped herein have Brazilian native peoples' reservations. This population has a high CI-TB in the state (243.8 / 100,000), probably because they have less resistance to the bacillus and are currently living in extreme poverty, which translates into malnutrition and poor living and housing conditions, factors

that favor the disease onset. [12] These data indicate the need for priority attention of health services, aiming at disease control.

The FHS plays an essential role in interconnecting the different sectors involved in TB control, considering the local reality in the planning of strategies, offering assistance that includes humanized integral care, including health care and social care, aiming to meet the protocols established by the Ministry of Health, having DOTS as one of the main tools used in patient care. Comprehensive care, as well as the offer of DOTS, promotes the approximation between the health care team, the patients and their families, favoring the identification of risk groups for non-adherence to treatment, based on a low-cost method. [13-15]

Data obtained here indicate that G1 municipalities have a low FHS coverage and there was a low offer of DOTS, with an abandonment rate higher than that recommended by the Ministry of Health, which is 5%. [15] The municipality of Contagem (MG) also showed a low percentage of FHS coverage (50.4%), abandonment rate of 15.3%, although the offer of DOTS was higher in this group of municipalities (23.6%). [16]

An ineffective follow-up by health care teams favors treatment abandonment, so it is necessary for the Family Health teams to adopt a proactive attitude when caring for TB patients and their families, by using the consultation as an opportunity to establish a therapeutic project, in which both professionals and users are involved. [17]

Among the G2 municipalities, which also have a low FHS coverage when compared to other groups, a higher percentage of DOTS offer and a low abandonment rate can be observed. The success of DOTS depends on the involvement of professionals in ensuring continued care for TB patients. [18]

Although the FHS units are mainly implemented in areas with important social problems, such measure does not always guarantee the resolving capacity of these services, considering the fact that the municipalities that invest in this strategy alone show no improvement in the markers of TB care organization. [19]

This study shows that the G3 municipalities had an FHS coverage above 90%, but there was no offer of DOTS and the rate of treatment abandonment was high. Among the municipalities grouped in G6, despite having the highest FHS coverage and a high offer of DOTS, the abandonment rate was well above that recommended by the Ministry of Health. Thus, greater attention is needed in cases of TB treatment abandonment, since they represent a major obstacle to be overcome and translated into better cure rates. [19]

A set of socioeconomic determinants, such as unemployment and low level of schooling, as well as problems related to alcoholism, smoking and the use of illicit drugs, are responsible for lower adherence to treatment, so it is necessary to develop actions based on integral care, identifying the patients' needs and how they perceive their health condition, so that the indicators can be improved.[6] Successful TB control, by minimizing the risks of infected individuals becoming ill, and getting them to be cured, if they become ill, as well as completing treatment, requires a view that goes beyond diagnosis and treatment. It is necessary to look at social issues, which include providing support to individuals who abuse alcohol or other psychoactive substances, improving living conditions, and providing access to information, among other actions.[20]

The FHS are the main pillars in the adoption of TB control measures, being an essential link between the patient and the health service. [21] In the city of Curitiba, state of Parana, this strategy played a fundamental role in the disease control, through investments in health professionals' training and implementation of DOTS in all units, with consequent reduction in the number of new cases of the disease, a reduction in the rates of treatment abandonment and deaths due to TB.[14] The municipalities grouped in the G7 had good FHS coverage, a high percentage of DOTS offer and the lowest index of treatment abandonment among the municipalities of the state of Mato Grosso do Sul.

The spatial analysis discloses the heterogeneity among the assessed municipalities, regarding the FHS coverage and the offer of DOTS, as well as the fight against treatment abandonment, aiming at TB control.

The National Tuberculosis Control Program (PNCT) advocates the decentralization of actions, encouraging the Family Health Strategy (FHS) professionals to act; the expansion of control actions to 100% of the municipalities is one of the goals to be achieved by the program and these actions must take place within the scope of basic care, where the FHS is included. [3] For this purpose, it is necessary to establish planned and interconnected actions between the state and municipal managers, ensuring the implementation of TB control actions at the local level, both efficiently and effectively.

There is a tendency among health professionals to point out that the patient is responsible for the success of treatment adherence or abandonment. However, the team members should be constantly evaluating their results, identifying strengths and difficulties found in the service, getting all those involved to find ways to contribute to the efficiency and

effectiveness of disease control, effectively motivating treatment adherence, without blaming the patient for the therapy failure.[22,23]

The DOTS strategy has shown good results in several countries that have adopted this practice and should be recognized and encouraged by the managers, through the training and sensitization of the professionals involved in TB control and the fight against the disease, about the importance of this therapy and, for patients, through the offer of social incentives, which may positively interfere with treatment adherence.[24]

The data presented here should be considered while taking into account the limitations due to secondary data collection, which are subject to the underreporting of cases and possible inconsistencies between the databases used. However, the results indicate a diversity of characteristics among the municipalities in the state of Mato Grosso do Sul regarding the fight against TB treatment abandonment and control, since there are many municipalities that need to improve the FHS and/or invest more in the offer of the DOTS, so that these strategies can be more effective. It is imperative that health professionals and managers prioritize and plan actions that can contribute to an effective control of TB transmission and better treatment adherence.

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