Factors Influencing the Delay in Diagnosis of Tuberculosis in Patients Reported with TB in the Rural Hospital of Chicumbane

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Abstract

Objective: To identify the possible factors associated with patient delay in the diagnosis of tuberculosis in the Xai-Xai district.

Methods: A cross-sectional study was carried out and the study population consisted of patients diagnosed and notified with tuberculosis at the Chicumbane Rural Hospital in the second half of 2017, with two months or more of treatment. Non-probabilistic sampling were done. 100 cases were reported with tuberculosis and included in the study. Also were done semi - structured interviews.

Results: 100 patients were included in the study. The average age of the interviewees was 42 years of age and 38% of the patients travelled between 6 and 10 km to find the first nearest health unit. 21 patients took between 9 to 14 days to start the treatment and in turn, are the ones that took the least time to make the first medical visit from the beginning of the symptoms until the 30 days. The distance from the home to the health center (p = 0.004) and first symptoms (p = 0.002), were associated with delay in diagnosis by patients.

Conclusion: The distance from home to the health center and the first symptoms are the factors that influences the delay in diagnosis of the patients. The knowledge of the first signs and symptoms on the part of the those is very fundamental, since these need to be well known by the community.

Keywords: Tuberculosis; Patient Delay; Factors Associated; Xai-Xai District; Mozambique

Introduction

Tuberculosis (TB) is a serious problem of Global Public Health. By 2016, there were around 10.4 million new cases of tuberculosis worldwide, of which 10% occurred among people living with HIV. Seven countries accounted for 64 percent of the total burden, with India at the top, followed by Indonesia, China, the Philippines, Pakistan, Nigeria and South Africa. It is estimated that 1.7 million people died from the disease, including about 400,000 people who were coinfected with HIV [1].

The African continent was the second with the largest number of new cases of TB, contributing with a global incidence of 26% of cases worldwide, and Sub-Saharan Africa where Mozambique is a part, continues with a high burden of TB/HIV coinfection, where it exceeded the 50% of the global population with coinfected TB, showing that in this region of the world TB/HIV coinfection is really a public health problem [2].

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Mozambique is among 22 countries with the highest burden of TB in the world and in the sub-list of 14 countries with a high burden of TB/HIV. The TB notification rate in the country in 2011 was 47,452, in 2012 it was 50,827, in 2013 it was 53,272, in 2014 it was 58,270, and in 2015 it was 61,576, representing a 30% increase in 5 years. And from 2014 to 2015 the increase was in the order of 6%, but there was a reduction in concerning to 9% registered in 2014 [3].

Even with advances in health population, as well as health policies, TB cases continue to be diagnosed late, contributing to increase the disease transmission and delay the therapeutic process [4].

Early diagnosis and initiation of appropriate treatment is considered to be one of the key measures to combat TB as well as to reduce disease transmission in the community [5,6].

In Mozambique, delay in diagnosis, is general problem for many health centers along the country, and Gaza province where the present survey was conducted, is the province with the highest prevalence of HIV [7] and consequently, is one of the provinces with larger cases of TB/HIV co-infection and most of the patients with TB are late diagnosed [8].

The problem of delayed diagnosis of the disease may be associated with both, the patient and the health service. In relation to the patient, the delay in the diagnosis of TB is understood as the period from the appearance of the first symptoms until the first formal visit to any health unit and for Health Service, the delay is understood as the period of time between the first visit of the person at any health service until the date of diagnosis [5].

Considering this scenario, the present research intends to identify the possible factors associated with patient delay in the diagnosis of tuberculosis in the Xai-Xai district, since the majority of the patients arrive at the health center already in the advanced phase of the disease, associated with the increase in the number of the mortality rate, which is around 9%, a percentage that exceeds WHO's target which is less than or equal to 5% [2,8].

Methods

Study area and participants

The study was conducted at Chicumbane Rural Hospital, located in Gaza province, Xai-Xai district, at the administrative post of Chicumbane.

The choice of this health unit, is due to the fact that it welcomes the majority of patients in the district, both for those in need of hospitalization well as those who seek outpatient care, which makes it the third health unit that more cases of tuberculosis notifies in the province of Gaza, after the Carmelo Health Center and Xai-Xai City Health Center and is the health center with the highest mortality rate in the province.

A cross-sectional study was carried out and the study population consisted of patients diagnosed and notified with tuberculosis at the Chicumbane Rural Hospital in the second half of 2017, with two months or more of treatment.

Data collection

For this study, was done non-probabilistic sampling for convenience. 100 cases were reported with tuberculosis and included in the study in the period under analysis. In the study, were used the semi - structured interview sheets with the aid of a tape recorder as data collection instruments and were done interview and observation as technique of data collection.

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Interviews and observations were carried out in the tuberculosis program of rural hospital, where patients were notified and followed, and the investigator administered the interviews to each patient diagnosed with TB found in the hospital at the time of data collection according to the inclusion criteria. Were included for the study, tuberculosis patients enrolled in the program in the second half of 2017 with two months of treatment or more and age over 18 years, good mental capacity to answer the questions and were excluded those who did not have the above mentioned parameters.

The interviews were administered to the patients after reading an informed consent, and the testimonies were recorded in audio format. In cases where recording was impossible, notes were taken during the interview. The content of the interviews was transcribed and then analysed for its content. Patients were invited to participate in the free-form study, from the explanation and signing of the informed and informed consent that was previously explained to them about the objectives, methodologies and purposes of the study.

The quantitative data were introduced into a Microsoft Excel spreadsheet and exported to the SPSS package V.23, where statistical analysis were performed.

Confidentiality was guaranteed by patient anonymity by not disclosing their names and the data collected were used exclusively for the purpose of the study. The protocol was submitted for analysis and ethical approval by the Institutional Committee of Bioethics for Health of the Higher Institute of Health Sciences of Maputo with opinion nr TFCSPRS32/17.

Data analysis

Qualitative data were categorized and analysed using the chi-square test. Non-parametric variables were analysed using the Kruskal-Wallis test. A level of statistical significance of $p < 0.05$ and a confidence interval of 95% was defined. Logistic regression at 95% CI was performed to determine factors associated with patient delay in the diagnosis of the disease.

Results

100 patients were included in the study. The socio-demographic characteristics presented in table 1, show that the average age of the interviewees was 42 years of age and 38% of the patients, travelled between 6 and 10 km to find the first nearest health unit. 95% of the patients had tuberculosis for the first time and 34% of the patients lived in a household of up to 6 members. Of those interviewed, only 34% said they had sought the health centre as the first location and almost all patients had fever and cough as one of the first symptoms of the disease.

Variable	Categories	n (%)
Sex	Female	45 (45)
	Male	55 (55)
Age group (years)	Up to 30	19 (19)
	Between 31 to 40	37 (37)
	Between 41 to 50	20 (20)
	51 or more	24 (24)

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Marital status	Married	28 (28)
	Not married	23 (23)
	Marital union	40 (40)
	Widower	9 (9)
Education	High school	24 (24)
	Primary level	25 (25)
	Illiterate	51 (51)
Distance from home to health center	1 to 5 km	28 (28)
	6 to 10 km	38 (38)
	11 to 15 km	13 (13)
	>=16 km	21 (21)
Occupation	Domestic	15 (15)
	Public employee	2 (2)
	Other	83 (83)
Personal transport	No	85 (85)
	Yes	15 (15)
Alcohol consumption	No	85 (85)
	Yes	15 (15)
Smoking habits	No	92 (92)
	Yes	8 (8)
First time having TB	No	5 (5)
	Yes	95 (95)

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Household	Up to 6 members	34 (34)
	Between 7 to 8 members	24 (24)
	Between 9 to 10 members	22 (22)
	11 members or more	20 (20)
First site sought at the beginning of illness	Health Center	34 (34)
	Healer	12 (12)
	Private nurse	1 (1)
	Pharmacy	9 (9)
	Church	3 (3)
	Others	41 (41)
First symptoms	Fever, weight loss, cough	3 (3)
	Fever, cough, general asthenia	10 (10)
	Fever, cough, night sweats, expectoration	2 (2)
	Cough	30 (30)
	Cough, general asthenia	3 (3)
	Cough, chest pain	3 (3)
	Cough, expectoration, weight loss, fever	3 (3)
	Cough, expectoration, weight loss	23 (23)
	Fever, cough	11 (11)
	Cough, weight loss	3 (3)
	Coughing, night sweats	3 (3)
	Cough, night sweats and chest pain	6 (6)

Table 1: Socio-demographic characteristics of patients.

Table 2 shows the time from onset of symptoms to the first visit and the time from the first consultation to the beginning of treatment. In the table 2 is possible to see that 21 patients take between 9 to 14 days to start the treatment and in turn, are the ones that took the least time to make the first medical visit from the beginning of the symptoms until the 30 days. Also in this table it was possible to see that

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11 patients took 20 days or more from the first consultation until the beginning of the treatment, although they took a long time (between 46 and 90 days) to make the first consultation in a health center since the first symptoms. The median patient delay was 22 days and for the system 19 days.

Time to onset of symptoms until the first visit		Time from the first consultation to the beginning of treatment			
		Up to 8 days	Between 9 to 14 days	20 days or more	Total
< 30 days	n	9	21	5	35
	%	25,7	60,0	14,3	100
Between 31 and 45 days	n	1	7	2	10
	%	10,0	70,0	20,0	100
Between 46 and 90 days	n	9	9	11	29
	%	31,0	31,0	37,9	100
91 days or more	n	2	3	3	8
	%	25,0	37,5	37,5	100

Table 2: Time of onset of symptoms until the first consultation and the beginning of treatment.

Table 3 shows the factors associated with the late diagnosis of patients reported with TB in the Rural Hospital of Chicumbane in the second half of 2017. Of the various factors analyzed, the distance from the home to the health center (p = 0.004) and first symptoms (p = 0.002), were associated with delay in diagnosis by patients.

Categories	Time delay			
	< 30 dias	> 30 dias		
	n (%)	n (%)	p	*OR adjusted (IC 95%)
Sex				
Female	18 (49)	30 (61)	0,888	-
Male	19 (51)	19 (39)		
Age group (years)				
Up to 30	14 (38)	12 (24)	0,131	-
Between 31 to 40	9 (24)	13 (35)		
Between 41 to 50	6 (16)	12(24)		
51 or more	8 (22)	12 (24)		
Marital status				
Married	7 (19)	13 (27)	0,019	-
Not married	20 (54)	16 (44)		
Marital union	6 (16)	16 (33)		
Widower	4 (11)	4 (8)		
Education				

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Illiterate	19 (51)	27 (55)	0,640	-
Primary level	6 (16)	12 (24)		
High school	12 (32)	10 (20)		
Occupation				
Domestic	7 (19)	3 (7)	0,999	-
Public employee	1 (3)	1 (2)		
**Other	29 (78)	42 (86)		
Distance from home to health center				
1 to 5 km	14 (38)	11 (22)	0,004	3,33 (1,8-5,7)
6 to 10 km	10 (27)	24 (49)		
11 to 15 km	5 (14)	7 (14)		
>= 16 Km	8 (22)	7 (14)		
Personal transport				
Yes	7 (19)	6 (12)	0,845	-
No	30 (81)	43 (88)		
First time having TB				
Yes	36 (97)	45 (92)	0,745	-
No	1 (3)	4 (8)		
First site sought at the beginning of illness				
Health Center	21 (57)	13(27)	0,877	-
Healer	2 (5)	7 (14)		
Private nurse	1 (3)	0 (0)		
Pharmacy	5 (14)	3 (6)		
Church	0 (0)	2 (4)		
***Other	8 (22)	24 (49)		
Household				
Up to 6 members	12 (32)	18 (37)	0,409	-
Between 7 to 8 members	12 (32)	9 (18)		
Between 9 to 10 members	10 (27)	9 (18)		
11 members or more	3 (8)	13 (27)		
Alcohol consumption				
Yes	5 (14)	7 (14)	0,749	-
No	32 (86)	42 (86)		
Smoking habits				
Yes	2 (5)	4 (8)	0,837	-
No	35 (95)	45 (92)		
First symptoms				

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Fever, weight loss, cough	2 (5)	1 (2)	0,002	2,93 (1,5-4,8)
Fever, cough, general asthenia	5 (14)	9 (18)		
Fever, cough, night sweats, expectoration	0 (0)	1 (2)		
Cough	12 (32)	3 (6)		
Cough, general asthenia	0 (0)	15 (31)		
Cough, chest pain	2 (5)	0 (0)		
Cough, expectoration, weight loss, fever	0 (0)	2 (4)		
Cough, expectoration, weight loss	2 (5)	4 (8)		
Fever, cough	7 (19)	7 (14)		
Cough, weight loss	1 (3)	2 (4)		
Coughing, night sweats	5 (14)	2 (4)		
Cough, night sweats and chest pain	1 (3)	3 (6)		

Table 3: *Factors associated with delay in diagnosis of patients reported with TB in the Rural Hospital of Chicumbane, in the second half of 2017*

*Reference to first category; **Hawkers, self-employed; ***They stayed at home, herbal treatment without going to the healer.

Discussion

Analyzing the results of table 1 on the socio-demographic characteristics, it is evident that the majority of the participants that sought the health center were male and without schooling. This may be explained by the fact that the majority of women have the responsibility of caring for the household and their families, especially in rural areas of Mozambique, and being underprivileged in relation to men. A study of factors associated with the delay in the diagnosis of tuberculosis also showed that women who were socioeconomically disadvantaged were more vulnerable [9], although other authors found the opposite [10]. Although delay factors are partly under the patient's responsibility, health system, has not been able to respond to the needs in the desired time [5,11,12].

Although technical manuals have not described an ideal time for the diagnosis of tuberculosis to occur, a recently published systematic review study [13] for developing countries points to an average of 3 to 4 weeks. Most patients (65%) took more than 30 days to go to the clinic, and 21% took more than 20 days from the first visit to the start of treatment, revealing the need to improve the quality of system services [11].

The distance that patients travel to the first health center was associated with a delay in the diagnosis of tuberculosis. This may be justifiable because in many rural communities in Mozambique, communities travel long distances to find the first health unit. And without transportation means, the distances can constitute a limitation for the search of the health units as soon as the first symptoms begin [12,13].

The first symptoms are extremely fundamental for the patient to decide to go to the health center immediately. In this study, this variable was associated with patient delay in diagnosis [12]. Most of the time, in addition to the lack of transportation and physical difficulty

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to move to a nearby health center, some patients ignore the signs and symptoms, which was verified in a study that analyzed the time between onset of symptoms and treatment of the tuberculosis, in which the main reasons described by the patients for the delay in seeking medical attention were in part a negligence of the patients [14,15]. Similar results were also found by other authors [6,16-19].

Although alcohol consumption is not associated with delay in diagnosis by the patients, it deserves attention in this research, since many patients because of this addiction, ignore the first signs and symptoms of the disease, or when they start with the treatment, they may even leave on account of alcohol, as demonstrated in a study carried out at a health center in the city of Maputo, in which it was intended to identify the factors leading to the abandonment of TB treatment [20].

Conclusion

Delay in diagnosis of tuberculosis remains a major challenge for tuberculosis control programs. This problem is most evident in rural areas where access conditions and basic health care are most often disabled regarding to urban areas. The distances travelled by patients to find a health center closer to them will continue to be a major limitation not only for patients in the district of Chicumbane but for all rural areas of Mozambique.

The knowledge of the first signs and symptoms on the part of the patients is very fundamental, since these need to be well known by the community and this, it needs to be instructed so that as soon as it has such signs, go immediately to a nearby health center. Intensification of active search and community DOTS is important to reduce delays in diagnosis.

In this study, the distances travelled by the patients from the home to the health center and the first symptoms were associated with the patients' delayed diagnosis. However, it is important to point out that the first site sought, although not statistically significant, may have some influence on patient delay in diagnosis of tuberculosis.

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Author's Contribution

Germano Pires: Design protocol; Analysis of data, write the final report for publication, revised and approved the final report.

Maria Isabel Cambe: Revised and approved the final report

Granélio Tamele: Revised and approved the final report

Joerge Jone: Revised and approved the final report

Rosa Simango: Design protocol; collect data; Analysis of data, revised and approved the final report.

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