



Assessment of the quality of life in patients with pulmonary tuberculosis in the pulmonology department of Fann hospital in Dakar

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Abstract

Introduction: Tuberculosis is a contagious and stigmatizing disease with a significant psychosocial impact. This is how we enjoyed the quality of life for these 112 tuberculosis patients.

Methodology: This is a prospective descriptive and analytical study carried out over a period of 7 months: from 1st October 2017 to 30th April 2018 at the Pneumology department of Fann Hospital.

Results: The average age of our patients was 37.39 (+/- 15.8 years). years old. The sex-ratio was 2.17 for men. The majority of patients had pulmonary involvement of 80%, bifocal: pulmonary and extra-pulmonary in 16.37% of patients and exclusively extra-pulmonary in 6.37% of cases.

The evolution was complicated in 14 patients (27.67%) with 4 cases of thromboembolic venous disease, 5 cases of pneumothorax (3 pneumothorax and 2 pyopneumothorax) and 5 cases of hemoptysis related to localized bronchial dilatation. However, all these patients had a favourable evolution from the third month of anti-tuberculosis treatment.

There were 8 cases of death (7.15%), of which 4 had HIV1.

We studied the quality of life in patients with the Saint-Georges questionnaire. The results showed an average score of symptoms (23.81%), activities (44.77%), impacts (38.8%) and the average total score (39.32%). These scores differed according to whether patients were newly diagnosed or not.

Depression was found in 18.75% of patients while 14.29% of patients suffered from anxiety.

Conclusion: This study proves that tuberculosis is a psychosocial disease that can alter the quality of life of patients with a significant anxio-depressive component.

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Introduction

Tuberculosis (TB) still constitutes a major public health challenge due to its high mortality and morbidity rates [1]. In 2017, 10.4 million people contracted the disease and 1.8 million died from it. More than 95% of tuberculosis deaths occur in low and middle income countries. Multidrug-resistant tuberculosis (MDR-TB) is a serious public health crisis and a threat to health security. WHO estimates that, in 2017, there were 558,000 new cases of TB with resistance to Rifampicin, 82% of which are TBMR, that is, with resistance to Rifampicin and Isoniazid [2]. Tuberculosis occurs most often in disadvantaged people and is associated with chronic respiratory failure and forms of sequelae that can affect quality of life. In Senegal, a study conducted in the Pneumology Department at Fann Hospital in Dakar regarding patients suffering from respiratory failure under long-term oxygen therapy showed that the main etiologies were tuberculosis sequelary lesions (46.6%), pulmonary fibrosis (31%) and COPD (19.3%) [3].

There is a few data on the impact of tuberculosis on lung function and quality of life of patients. The objective measurement of this impact is usually assessed using respiratory functional explorations, which are not always available in our resource-limited countries. Quality of life can be used as a primary or secondary evaluation criterion in prognostic, therapeutic and medico-therapeutic studies. This is how we carried out a prospective study whose main objective is to evaluate the quality of life of patient's suffering with tuberculosis at Fann Pneumology department.

The specific objectives are

- To evaluate the psychosocial impact of tuberculosis patients;
- To evaluate, through the Saint George's Hospital Respiratory Questionnaire (QRSG), the functional impact of the activity and the impact on the daily life of tuberculosis patients diagnosed.
- To detect, through the Hospital Anxiety and Depression (HAD) test, the anxiety and depressive disorders in these patients.

Methodology

Type and scope of study

This is a prospective descriptive and analytical study carried out over a period of 7 months: from 1st October 2017 to 30th April 2018 at the Pneumology department of Fann Hospital.

Study population

It concerns all outpatients and hospitalised patients diagnosed with pulmonary tuberculosis or multifocal tuberculosis with positive microscopy.

Selection criteria

• Inclusion criteria

- First-ever case of tuberculosis whatever its bacteriologically confirmed location
- All bacteriologically confirmed tuberculosis recurrences

• Exclusion criteria

- Multidrug-resistant tuberculosis.

- All bacteriologically negative tuberculosis

• Non-inclusion criteria

- Patients who had an incomplete or inoperable record.

Collection tool

We developed an anonymous questionnaire for data collection. The parameters studied are as follows:

- Patient's civil status: this had to do with age, sex, marital status, professional activity, and socio-economic level of patients.
- Background: passive and active smoking, HIV, diabetes, etc.

Clinical and paraclinical signs

- Reasons for consultation: cough, dyspnea, hemoptysis and chest pain.
- Physical examination to look for the different pneumological syndromes.
- Biology: blood count (NFS), CRP, transaminases (AST, ALT), urea and creatinine.
- Bacteriology with: Sputum for acid-fast bacilli, Xpert MTB/RIF from sputum or any other pathological product, detection of Mycobacterium tuberculosis in BACTEC Culture.
- Radiography in search of alveolar, alveol-interstitial liquid, gaseous or mixed pleural cavity, mediastinal syndrome.

The evolution is favourable, marked by a weight gain and stable apyrexia. Unfavourable evolution in the presence of complications like: persistent fever, dyspnea, hemoptysis, etc....

Quality of life assessment: the Saint Georges Respiratory Questionnaire (QRSG) will assess it and the Hospital Anxiety and Depression (HAD) tested.

The QRSG is an instrument specifically designed for patients with chronic respiratory diseases. It consists of 50 questions put in 3 dimensions: symptoms, impact of the activity and impact on daily life.

A total dimension summarizes all the information by adding all the responses on the questionnaire and expressing the result as a percentage of the maximum possible for the entire questionnaire. The maximum possible score is 3969.4.

Results: - score at 0: indicates maximum deterioration in quality of life;

- score ≥ 20 : reflects an impaired quality of life;
- score ≥ 34 : exposed to an increased mortality prognosis;
- score at 100: refers to an optimal quality of life.
- The HAD scale is a tool that seeks to identify an anxiety-depressive symptomatology and assess its severity. The items are divided into two sub-scales. Each item has four response modes ranging from 0 to 3. An overall score is calculated by summing the responses to the 14 items (ranging from 0 to 42), as well as two subscores corresponding to the two subscales (ranging from 0 to 21).

Results: - From 0 to 7: Absence of anxiety disorders and de-

pressive disorders,

- 8 to 10: suspected anxiety or depressive disorders
- 11 to 21: proven anxiety or depressive disorders.

Limitations of the study

Refusal to participate in the study and some incomplete files.

Data entry and analysis

The data was processed with the following software: Excel for tables; Word for data entry and Epi info for SPSS analysis, STATA and KHI 2 test to compare quantitative variables.

Descriptive study

Sociodemographic and economic data

The study involved 112 bacteriologically confirmed tuberculosis patients. The average age of the patients was 37.39 years with a standard deviation of 15.08 (extreme: 15 and 86 years). The male gender was 68.47% of cases, a sex ratio of 2.17. Traders and tailors had 20.22% and 13.48% respectively a relatively higher figure compared to patients from other fields of work.

The proportion of patients who are not gainfully employed such as housewives, students and pupils were 20.22%, 15.04% and 7.07% respectively.

The majority of patients were poor, 67.27 and financially dependent on their families. Only 32.73% of our patients were autonomous and almost all of the autonomous patients had an average of 5 dependents. Nine patients (7.9%) of the population had no income and no financial support.

Comorbidities and clinical signs

Smokers accounted of 26.79% of patients. Approximately 1/5 patients had a history of pulmonary tuberculosis treated and cured. Other histories found: asthma in two patients, HIV and viral hepatitis B in four patients each.

The average diagnostic time for our patients is 12.03 days (extreme: 1 and 28 days). Functional signs were dominated by cough (78%), chest pain (33.93%), hemoptysis (32%) and dyspnea (20%). Infectious syndrome was present in 62.5%. Most patients had lung disease (80%). Thirty-six patients (16.37%) had bifocal pulmonary and extra-pulmonary localization. Four patients (3.57%) had pure extra-pulmonary localisations. The average hospitalization time was 16.56 days on average (extremes: 1 and 59 days), and on pleuro-pulmonary physical examination, pulmonary condensation syndrome was found in the majority of cases in 52.35% of cases.

Paraclinical signs

We noted positive AARB sputum in 86 out of 97 patients (98.96%). In addition, 21 patients had GeneXpert MTB/RIF positive and sensitive sputum out of a total of 34 patients (61.76%). The pleural fluid genexpert tested positive in 5 out of 12 patients who were sensitive to Rifampicin. The bacteriology of the pleural fluid had also isolated 1 case of *E. coli*, 2 cases of *K. pneumoniae*, 1 case of *P. aeruginosa* and 4 negative cases.

We found seven patients with hepatic cytolysis.

Alveolar-interstitial syndrome was found in the majority of patients (75%), followed by liquid, gaseous or mixed pleural

syndrome in 12.5% patients. (There was parenchymal destruction in 24.99% patients).

An angioscanner was conducted for six patients with respiratory distress, and confirmed proximal pulmonary embolism in two patients. A venous Doppler ultrasound of the lower limbs confirmed two phlebitis.

Evolution of disease

The treatment outcome was favourable in the short term in 68 patients (60.71%) with stable apyrexia after an average of 5 days, weight gain and improvement in clinical signs after one week.

The evolution was complicated in 14 patients (27.67%) with 4 cases of thromboembolic venous disease, 5 cases of pneumothorax (3 pneumothorax and 2 pyopneumothorax) and 5 cases of hemoptysis related to localized bronchial dilatation. However, all these patients had a favourable evolution from the third month of anti-tuberculosis treatment.

In 18 patients (16.07%), the evolution was marked by a persistent change in general condition, (fever), during the first three weeks of antituberculosis treatment. However, there was a favourable trend for one month of anti-tuberculosis treatment. There were also sequelae of pachypleuritis type in 4 patients, DDB in 18 patients, parenchymal retraction in 12 patients, and extensive parenchymal destruction in 10 patients.

There were 8 cases of death (7.15%), of which 4 had HIV1. The latter presented multifocal tuberculosis with profound impairment of the general state. The average CD4 count in these patients was 64.5 CD4/mm³ (extreme: 22 and 130). ARV treatment was started in two patients. One of them had hemophagocytosis syndrome with pancytopenia (leukocytes at 2890, hemoglobin at 7.2g/dl, platelets at 79000), LDH at 670 IU/l and transaminases at 3 times normal. The medullogram in this patient showed signs of hemophagocytosis. Four patients were lost to follow-up after the third month of tuberculosis treatment.

Analytical study

Assessment of quality of life and socio-demographic aspects

Relationship between St Georges/HAD and sex

Men had a much more impaired quality of life than women. We noted that 34.58% of our patients had a disturbed HAD scale: moderate to severe with depressive symptoms in 26.17% of men compared to 2.4% of women (*Table 1*).

Table 1: Economic model diagram

	Sex			Total
	Male	Female	Total	
St Georges				
< 20	10	3	13	
20 - 34	24	10	34	
34-100	39	21	60	
Total	73	34	107	

Relationship between St Georges/HAD and age

The 20 to 40 year-old age group, at an average QRSg score of less than 34 in 29 young patients, had a much more impaired quality of life than the rest of the population, while the average QRSg score was 5 in patients over 60 years of age. In addition to poor quality of life, anxiety and depression disorders were also in the majority in this age group (Table II).

Table 2: Relationship between Saint Georges and Age

Age Group	St Georges (in percentage)			
	Less than 20	20 to 34	34 to 100	Total
0 to 19 years	1	2	3	6
20 to 40 years	11	18	34	63
40 to 60 years	0	10	17	27
60 to 86 years	1	4	6	11
Total	13	34	60	107

St Georges/HAD relationship and income

Almost all patients who earned no income, (7.9%) of the population, had a severe impairment of quality of life with QRSg (symptoms (26%), activity (31%), and impact (18%). More than half of the patients who needed financial support, (65.6%), had an impaired quality of life with an average QRSg score of 32.7%. The HAD test was disrupted in both categories with moderate depression found.

Quality of life assessment and co-morbidities

- Relationship between st Georges / HAD and HIV status

Retroviral serology was explored in 104 patients (92.86%) of the population. It was positive in 4 patients (3.84%) living with HIV1. We found that there was a statistically significant relationship between impaired quality of life and HIV status (p=0.02) (Table III). The evolution of these HIV-positive patients was marked by a 100% death rate. Three out of four patients had a normal HAD scale and only the one with hermophagocytic complications had severe depressive symptoms with a score above 20.

Table 3: Relationship between Saint George and HIV

		HIV		
		Negative	Positive	Total
St Georges (in %)	< 20	12	4	13
	20 to 34	30	0	34
	34 to 100	58	0	61
	Total	100	4	104

- Relationship between St Georges/HAD and diabetes

It was noted that the majority of diabetic patients 70% had an impaired quality of life. However, there was no anxiety and depression in our diabetics (Table IV).

Table 4: Relationship between Saint George and Diabetes

		Diabetes		
		No	Yes	Total
St Georges	<20	13	0	13
	20 to 34	31	7	34
	34 to 100	58	3	61
	Total	102	10	112

Quality of life assessment and clinical signs

St George’s relationship and the number of tuberculosis episodes

Both the first episodes of tuberculosis (49%) and relapses (42.8%) had an impaired quality of life in almost half of the patients. However, there was no statistically significant relationship between the tuberculosis episode and impaired quality of life.

St Georges/HAD relationship, diagnostic time and hospitalization duration

There was a statistically significant relationship between length of hospitalization and impaired quality of life. More than a third of patients (39.3%) who were admitted in the hospital for more than 15 days had a significant deterioration in quality of life (p < 0.01). This change in quality of life was associated with depressive symptoms in 15% of patients.

Discussions

Epidemiological characteristics

The average age of our patients was 37.39 with (extremes : 15 and 86). A.R. Ouedraogo in Togo, recorded an average age 33.95+/-10.3 years [4] lower than ours. The 20 to 40 age group constituted 58.87% of the population. This could be explained by the youthfulness of the population in our developing countries, particularly in Senegal where those who are less than 20 years represent 55% of the population [5].

Men accounted for 68.47% of the population. Other African researchers had made same observations in the case studies conducted by Wandwalo et Morkve O. in Tanzania [6], Coulibaly Abdrahmane in Mali [7] 66.7% and 67% respectively of the male sex. This male predominance could be explained by the position of men in our African societies. Indeed, man’s social role as the pillar of the family requires that he work and take care of his family, to be in contact with the outside world, which facilitates contamination.

The number of jobless patients was very high (housewives, pupils and students, 20.22%, 15.04% and 7.07% respectively. Indeed, tuberculosis most often occurs in disadvantaged and precarious populations since they are likely to engage in promiscuity within the home [8]. Researchers such as A.R. Ouedraogo in Togo found in their patients a majority of occupations which are exposed to pulmonary irritants such as motorcycle taxi drivers, who represented 34.4% of their workforce [4].

Socio-economic characteristics

Almost all the patients who had no income, (7.9%) of the population, had a severe impairment of quality of life with QRSg (symptoms (15%), activity (18%), and impact (13%). More than

half of the patients who really needed financial support, 65.6%, also had deterioration in their quality of life. The HAD test was disrupted in both categories with moderate depression found.

Clinical characteristics

Localisation of tuberculosis

Regarding the distribution of localized tuberculosis patients, 90 cases (80.36%) were localized pulmonary tuberculosis, 36 cases (16.37%) had multifocal pulmonary and extra pulmonary tuberculosis and 4 cases (3.57%) were exclusively extra-pulmonary tuberculosis.

Out of the 112 patients affected, 86 (76.78%) had AARB positive and 26 or 23.21% had a GeneXpert positive and were sensitive to Rifampicin (18.75 positive for sputum and 4.46% positive for pleural fluid).

Coulibaly in Mali [7] found 73% of pulmonary localization cases, and 83% of pulmonary localization cases in Madagascar in the province of Toliana. In France, isolated or associated pulmonary forms accounted for 71.7% [9]. The prevalence of pulmonary localization is part of the normal distribution of tuberculosis and shows the importance of early diagnosis and adequate treatment of cases [10].

Comorbidities

HIV

Four patients were HIV positive (3.54%) and all were HIV1. They were 36 years on the average. The 20-40 age groups were the most affected by HIV, which explains the vulnerability of this age group to HIV infection. In addition, this age group is the most active segment of the population and also subject to migration. Several studies conducted on the coexistence of HIV/TB have found higher prevalence's in Congo Loemba (54.3%) [11] and Zimbabwe Schock (65%) [12]. This low rate in our study could be explained by the fact that the low national HIV prevalence in our country is around 0.5% [13]. In addition to other explanations given above, retroviral serology is not systematic in Senegal and that a prior informed consent of patients must be sought in order to have it carried out.

Smoking

We found a proportion of 26.78% of smokers with an average of 14.78 smoking a pack of cigarette a year. Fiogbe and Adambounou in Togo found a lower proportion of smokers with 7.7% and 22.82% respectively, with a consumption of less than 10 packs of cigarettes a year [4]. Lam et al in China found a high prevalence of airway obstruction in patients who smoked more than twenty packets per year and had significant radiographic sequelae [14]. For Lam et al, tobacco and tuberculosis sequelae have an additive and non-synergistic deleterious effect on lung function [14].

Clinical symptomatology

The average diagnostic time found in our patients was 12.03 days, well below the average time of 68.13 days found by [15]. Regarding the population we used for our study, almost all the patients were new cases, 78 in all (69.64%); the relapse rates were 30.36% and these patients were subject to retreatment.

The rate of new cases of Smear Positive Pulmonary Tuberculosis (SPPT) was 73.3% in Mali according to Coulibaly Abdrahmane [6]. This finding is similar to those in the literature with a

percentage average rate of 67.27% of all forms of cases of tuberculosis. M' Boussa Det al [16] found an average of 55% SPPT in Congo Brazzaville. Biological inflammatory syndrome was present in 25% of our patients. Sixty-three patients, (56.25%), had positive CRP. The results above may suggest the presence of frequent bronchial sur infection in these patients.

Evolution

The evolution was favourable in the long term in most of our patients, (96.42%) on specific treatment for 6 months and marked by a cure. For these treated patients, pulmonary sequelae were present in 44 patients (39.28%) with pachypleuritis (28%), bronchial dilation (12%), and parenchymal destruction (40%). This cure rate was well above the W.H.O target (cure rate=85%) [17]. Danyogos [18] in Mali had lower results with 68.78% cure and 8.52% death. We noted 8 cases of death, (7.15%), related to the disease and its complications. This rate is lower than the national average of lethality in Senegal [5]. This high case-fatality rate could be explained by the excessively high prevalence of HIV co-infection.

Evaluation of patients' quality of life

Socio-demographic and economic aspects

The study of population who are not paid for work done as well as unemployed patients was an average age of 39 years. Among these patients, 84.4% had an impaired quality of life with an average QRSO score of 39.32 points. BOKAPA found an average age of 36.96 years lower than ours with an average QRSO score of 27.09 points. [19].

Clinical aspects

Among our population, the majority of patients were new cases, 69.64%. Most of the studies established a higher prevalence than ours, for example, Coulibaly Abdrahmane [6] in Mali, found a slightly high rate of 73.3%. We were interested in studying patients' anxiety and depression. Depression was found in 18.75% of patients while 14.29% of patients suffered from anxiety.

The quality of life of patients was assessed using the Saint George questionnaire. Various studies have examined quality of life assessment using the QRSO. However, in all the research publications we consulted, the average total score beyond which quality of life can be considered impaired was not clear. Our results, when tuberculosis was diagnosed, showed an average symptom score of (23.81); activities (44.77); impacts (38.8) and the average total score (39.32). The study by Maguire et al. found higher rates compared to ours when tuberculosis was diagnosed, with an average symptom score of 41.9; an average activity score of 50.8; an average impact score of 43.4; and a total score of 45.4 points. Fiogbe Adambounou's study in Togo showed the average symptom score (15.03); activities (17.96); impacts (7.84) and the total score (15.09) [4]. The study conducted by Pasipanodya et al. showed a mean total score of 23.5 in QRSO in patients with a history of pulmonary tuberculosis [20].

In our study, the time to diagnosis and initiation of anti-tuberculosis treatment was 12.03, compared to 68.13 in the study by Bopaka et al. [19]. These quality of life assessment scores differed depending on whether patients were newly diagnosed or not. However, all these studies showed an improvement in quality of life as patients progressed with anti-tuberculosis treatment [21]. This shows that tuberculosis has an impact on

quality of life and that anti-tuberculosis treatment improves it considerably.

Quality of life and future of the patient

The analysis of the Saint George questionnaire in our study indicated a high risk of mortality, involving 65 patients, (59.63%), and all patients living with HIV. This rate is also high in many other studies, particularly in Bopaka [19] and Maguire [22] with average Saint George scores of 27.09 and 30.2 respectively. Among these patients, the majority had tuberculosis sequelae of parenchymal destruction with extensive lesions in 78% of patients, pachy pleuritic sequelae (12%), and extensive bronchial dilation (26%) in patients.

Patients with HIV co-morbidities (100%) smoking (65%) with diabetes (30%) had an impaired quality of life. Pasipanodya [20] makes the same remarks and finds a deteriorated quality of life in diabetics (42%) and in patients living with HIV (50%). This shows that the co-existence of tuberculosis with other co-morbidities is a poor prognostic factor of the disease.

Table 5: Relationship between complications and quality of life

St Georges	Complications						Total
	TVED	Hemophagocytic syndrome	Haemoptysis	PNO	PPT	P	
<20	2	1	0	0	1	0,005	1
20 to 34	2	0	4	2	1	0,03	6
34 to 100	0	0	1	1	0	0,06	15
Total	4	1	5	3	2		15

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Conclusion

Tuberculosis is an infectious disease with a serious psychosocial implication that can impair the functional prognosis and impact on patients' quality of life. Particular attention must be paid to this by both health authorities and clinicians. Indeed, the efforts of the national tuberculosis control programmes focus mainly on the bacteriological cure of tuberculosis patients, but no effort is subsequently directed towards improving the quality of life of these patients.

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