

A Study on The Health Related Quality Of Life In Patients Who Complete Treatment For Tuberculosis

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Abstract:

Introduction: Tuberculosis is one of the oldest infections known to affect humans. Pulmonary Tuberculosis (PTB) is a chronic infection, which has its effect on the lung even after it has been cured with anti-tubercular medications. In this study, we have tried to objectively study its effect on the lung function and health related quality of life.

Materials and Methods: A cross sectional analytical study was conducted in Kurnool medical College between May 2017 and September 2017. All participants signed an informed consent before entering into the study. Since the total number of patients who entered into the Provincial TB Clinic in Govt General Hospital during the research period were almost similar to the sample size; therefore, the first 100 patients attending the TB ward were selected in that period if they fulfilled the inclusion criteria. For selection of the control group, 120 random numbers were chosen and were assigned to people who consecutively entered into the Blood Transfusion Organization clinic.

Results: Before treatment, all scores of tuberculosis patients were lower than those of the controls ($p < 0.05$). The patients' score increased significantly after two months of treatment ($p = 0.01$), but the difference was not significant between two and six months after treatment ($p = 0.07$). The lowest score in tuberculosis patients was related to physical functioning and energy (45 ± 42 , 44 ± 24 , respectively).

Conclusion: According to the results, tuberculosis patients still have a low quality of life in spite of receiving new care strategies. Therefore, enhancement in quality of life may improve adherence to anti-tuberculosis treatment, functioning and well-being of patients with tuberculosis.

Key words: Tuberculosis, adherence, informed consent, Blood Transfusion.

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I. Introduction

Tuberculosis (TB) remains a major public health and economic problem worldwide [1]. World Health Organization declared TB alongside HIV as a leading cause of death killing almost 1.5 million people in the year 2014 and most of these deaths occurred in the developing world [2]. Increased knowledge and awareness about the disease is important along with early detection, diagnosis, and treatment in order to control TB. Though much attention has been given to clinical outcomes of therapy and microbiological cure, patient reported health related quality of life which can have a major influence on the clinical outcomes has been neglected. Treatment decisions should be based on patient preferences, which are also related to mental and social health in addition to physical health, to achieve better clinical outcomes [3]. The untreated patients can become a source of transmission of infection leading to spread of disease whereas irregularities in treatment can lead to drug resistance. Health related quality of life is the impact that perceived health status has on the normal functions of life. Reduced health related quality of life can lead to depression and medication nonadherence which can further lead to worsening of the medical condition.

Tuberculosis has been one of the leading causes of mortality and morbidity in the world especially in the developing countries. Conventionally the effectiveness of tuberculosis treatment has always been observed and measured in terms of clinical outcomes. However, it may also lead to disease-related depression. So with the emergence of new strategies for treatment and control the focus of TB management has been shifted from mortality to disease-related morbidity and patient reported quality of life. Twenty-two countries carry 80% of the global incident cases of tuberculosis (TB). These countries were designated high-burden countries (HBCs) by the World Health Organization (WHO) in 1998, and they have received accelerated assistance to increase case detection rates and improve treatment outcomes. All of the HBCs had adopted WHO's DOTS strategy by 2000. By 2007, national tuberculosis programs (NTPs) in all HBCs had achieved 100% DOTS coverage nationwide, providing access to standardized TB care through public sector health facilities

II. Materials And Methods

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The QOL measures were administered by trained investigators to the participants. TB patients completed these measures at the baseline, two months, and six months during their regular scheduled visits. Data for the study were collected by in-person interviews which were done by trained interviewers. All participants were interviewed face-to-face in completing the study QOL measures. Before study enrolment, all individuals were informed about the voluntary nature of participation and confidentiality as well as the use of their data for research purposes only. Also, the confidentiality of the participants' data was ensured by the lack of any identifying personal information. A two-part questionnaire including demographic data for the first part and the QOL questionnaire for the second part were designed. All TB patients answered the additional questions about their disease in the first part which included clinical type of TB (with pulmonary [smear positive and negative] and extra pulmonary tuberculosis diseases according to the WHO definitions for TB),² and the course of treatment (baseline, two months, and at the end of treatment). The second part consisted of 36 items short form SF-36 questionnaire to determine health-related quality of life.

The validity and reliability of the SF-36 questionnaire has previously been studied.¹⁰ The SF-36 questionnaire has been previously translated, validated, and standardized for the Iranian people (Persian version) by Montazeri et al.¹¹ This questionnaire contains eight categories assessing diverse concepts of health including physical functioning, physical role, bodily pain, general health, energy, social functioning, and emotional domain and mental health. In addition, certain domains can be aggregated to create the total QOL measures. For all the SF-36 categories and summary scores, higher scores indicate better health.

Statistical Analysis: All statistical analyses were done using SPSS, version 16 (SPSS, Chicago, Illinois). To compare variables, Chi-square and one-way ANOVA tests were used. Moreover, Pearson correlation was used to determine the association between continuous quantitative variables, and also the Spearman correlation was used to assess the relation between QOL scores and ordinal variables. Repeated measure analysis was done for comparing QOL of TB patients at different time points. Finally, linear regression analysis was used for adjustment of some confounding variables. All hypotheses tests were 2-tailed with $p < 0.05$ considered as significant. Data are presented as mean \pm standard deviation (SD) for quantitative variables and frequency and percentages for qualitative variables.

III. Results

In this study, 100 cases with TB and 120 healthy controls were enrolled. The mean age was 54, 44 years in the cases and controls, respectively. Table 1 shows the demographic characteristics data between the two groups. In the case group, 46 patients (72%) had pulmonary and 18 (28%) had extra-pulmonary TB. There were 31 (48%) smear positive pulmonary TB among the case group.

Characteristic feature	Group	
	TB patient (N=100)	Control (N=120)
Age (years)	54 \pm 10	44 \pm 19
Gender		
Male	42(42%)	67(55.83%)
Female	58(58%)	53(44.16%)
Marrital Status		
Single	45(45%)	54(45%)
Married	55(55%)	66(55%)
Education level		
Illiterate	50(50%)	65(54.16%)
Primary school	18(18%)	20(16.66%)
High school	19(19%)	19(15.83%)
University	13(13%)	16(13.33%)
Occupation		
Unemployed	25(25%)	33(27.5%)
Housekeeper	37(37%)	43(35.83%)
Farmer	20(20%)	20(16.66%)

Self employment	12(12%)	17(14.16%)
Govt job	5(5%)	5(4.16%)
Unspecified	1(1%)	2(1.66%)
Location		
Urban Area	57(57%)	80(66.66%)
Rural Area	43(43)	30(25%)

Table 1: Demographic characteristics of the patients with TB and Control group.

SF-36 category	Score		P-Value
	TB Patients (N:100)	Control (N=120)	
Physical functioning	65±26	76±25	0.002
Role functioning	42±39	70±27	0.001
Bodily pain	58±22	72±26	0.003
General health	49±17	65±17	<0.001
Energy	42±23	60±21	0.003
Social Functioning	58±26	59±22	0.001
Health Perceptions	49±29	69±26	0.001
Mental health	48±19	65±21	0.001
Total Score (QOL)	50±20	70±16	0.001

Table 2: Comparison of eight SF-36 category scores between the TB patients and the control group.

Baseline QOL was compared between cases and controls according to the SF-36 questionnaire. Table 2 shows this comparison and indicates the mean of SF-36 categories as well as the overall QOL score among the patients and the control group (at the baseline). The mean score of the QOL was 54±20 and 71±18 for the case and control groups, respectively. Overall, the QOL among TB patients at the onset of treatment was significantly lower than the healthy participants ($p<0.001$). The same difference was seen even after adjusting the subjects in terms of age, sex, marriage, education and type of disease using linear regression ($p<0.001$). The minimum score of SF-36 category among the two groups was related to energy category which was 44±24 and 63±21 for the cases and the controls, respectively. There were significant differences between the two groups in the eight categories of SF-36 scores, $p<0.05$. (Table 2)

The QOL of TB patients was assessed at two-months as well as at six-months after treatment with four-drug TB regimens. Overall, QOL score was 59±18 and 63±19 at two and six months after anti-tuberculosis treatment, respectively. The "Repeated Measure" test was used for inter-groups data at different time-points (0, 2, and 6 months after onset of treatment). This test indicated that the QOL of TB patients was significantly improved at two months after treatment ($p=0.01$). However, there was no statistical difference between the second and sixth months of TB treatment ($p=0.07$).

IV. Discussion

In this study, the QOL of TB patients was measured in three phases: at the onset of treatment, at two months, and six months after the initiation of anti-tuberculosis therapy. The results showed that the QOL was significantly increased after two months which indicated the positive impact of the four-drug TB regimens on the improvement of the QOL in these patients. However, there was no difference between the second and third phases of the QOL measurements. Chamal et al.⁷ in China conducted a study on 102 TB patients and assessed the QOL before treatment, after the initial phase, and at the end of treatment and compared them with 103 controls. They found that the QOL score of TB patients was low before the treatment and increased during the treatment course that was similar to the results of the current study. Although the QOL improved over the anti-TB treatment period, the overall QOL score at the end of six months remained lower than the general population. A systematic review published in 2009, demonstrated that TB patients in several studies had a lower QOL than the healthy population even after treatment.⁵

The reason for the low QOL even after six months anti-TB treatment may be related to psychological outcome of the disease due to isolation from the community and family life based on the contagious nature of TB infection, which also may lead to depression among TB patients. A study in Pakistan was carried out on 60 TB patients and showed that 80% of them were depressed. The study concluded this high rate of depression among TB patients was due to lower socioeconomic status, long treatment period, stigmatic nature of the disease, as well as fear and threat concerning the risk of transmitting infection from air-borne bacteria which all lead to decrease in resistance against the infection and response to the treatment which was followed by isolation and disappointment of the patient.¹⁴

On the other hand, six-months treatment with potentially toxic agents may lead to anti-TB related side effects such as isoniazid induced liver dysfunction or leukopenia due to rifampicin which may cause the QOL impairment. Wang et al. showed that the QOL of pulmonary TB patients decreased when compared to the

general population and its associated factors included focus size of infection, counts of white blood cells, complications, elevated ALT and the duration of disease.¹⁵ Therefore, a better QOL in TB patients can be achieved with proper information about the disease, route and condition of its transmission as well as periodical laboratory evaluations and repeated examinations over the treatment course to perform appropriate actions after drug complications.

V. Conclusion

The study yielded low QOL scores among TB patients, in spite of new therapeutic and surveillance strategies, and it is concluded therefore, that more attention should be focused on QOL improvement in order to improve response to the treatment and decrease the rate of drug failures as well as improvement of mental and physical functioning among TB patients.

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