

Quality of life among HIV-tuberculosis co-infected patients

Dharmendra Kumar Jha, Jyotsna Jha¹, Anshu Kumar Jha², Basavaprabhu Achappa³, Ramesh Holla⁴

Department of Medicine, Patliputra Medical College and Hospital, Dhanbad, Jharkhand, ¹Department of Obstetrics and Gynecology, Medical College, Kolkata, West Bengal, ²Department of Medicine, Assam Medical College, Dibrugarh, Assam, ³Departments of Medicine and ⁴Preventive and Social Medicine, Kasturba Medical College, Mangalore, Karnataka, India

Abstract

Background: India is the world's third leading country in terms of people living with human deficiency virus (HIV) (2.1 million) with 0.4 million deaths due to HIV-associated tuberculosis (TB). Physical and mental stress degrades the quality of life (QOL) in these patients. Studies have been done in HIV patients but very few on HIV-TB co-infected patients. Our study aims at assessing and comparing the QOL in HIV patients with and without TB.

Materials and Methods: It was a cross-sectional study done at Antiretroviral Treatment Center of KMC, Mangalore and District Wenlock Hospital, Mangalore, over 6 months. A sample size was 104. Semi-structured questionnaire to collect clinico-demographic data, World Health Organization QOL (WHOQOL)-HIV BREF to assess the QoL, and Beck's Depression Inventory Scale (Physical health, psychological well-being, social relationship, environmental health, level of independence, and spiritual health) to identify depression were used. The Cronbach's alpha was used to measure the internal consistency for each domain of the WHOQOL-HIV instrument.

Results: HIV-TB co-infected patients had a lower mean score in all domains as compare to only HIV patients, suggesting that HIV-TB co-infected patients had a poor QOL ($P < 0.05$). Internal consistency of each domain was good ($\alpha > 0.7$).

Conclusion: To improve the QOL in HIV patients, it is important to identify the determinants of QOL and work toward its improvement.


Keywords: Beck's Depression Inventory Scale, human deficiency virus, quality of life, World Health Organization quality of life-human deficiency virus BREF

Address for correspondence: Dr. Anshu Kumar Jha, Room No. 47, PG Boy's Hostel, Assam Medical College, Dibrugarh - 786 002, Assam, India.
E-mail: anshu_jha007@rediffmail.com

INTRODUCTION

India has the third largest number of people living with human deficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS). As per the 2016 HIV estimates, there are an estimated 2.1 million people currently living with HIV/AIDS in India with an adult prevalence of 0.31% in 2016.^[1] In 2016, 0.4 million people died of

HIV-associated tuberculosis (TB).^[2] TB is one of the leading causes of death among people living with HIV in the world. Without treatment, HIV and TB can work together to shorten lifespan. A person who has both HIV and TB has an AIDS-defining condition. TB and HIV co-infection is associated with special diagnostic and therapeutic challenges and constitutes an immense burden on health-care systems of infected countries. In

Access this article online	
Quick Response Code:	Website: www.picronline.org
	DOI: 10.4103/picr.PICR_99_18

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Jha DK, Jha J, Jha AK, Achappa B, Holla R. Quality of life among HIV-tuberculosis co-infected patients. *Perspect Clin Res* 2019;10:125-9.

2003, Government of India announced roll out of free antiretroviral treatment (ART).^[3] *Mycobacterium tuberculosis* and HIV act in synergy, accelerating the decline of immunological functions and leading to subsequent death if untreated.^[4] Physical and mental distress is found to be common in TB patients, leading to poor disease outcome or poor treatment outcome. To improve the quality of life (QOL), it is crucial to identify the determinants of QOL. Worldwide, many studies have been performed among patients with HIV, but there is a dearth of literature on the QOL of HIV-TB co-infected patients. In India, not many studies are done about this. In this study, we compare the QOL of HIV-infected patients with and without active TB and identify the factors responsible for the poor QoL among the HIV-TB co-infected patients.

Aim

1. To assess the QOL of HIV-infected patients with and without TB
2. To compare the QOL of HIV-infected patients with and without TB
3. To identify the factors responsible for poor QOL.

MATERIALS AND METHODS

It was a cross-sectional study conducted among HIV patients with and without TB (study population was divided into two groups – one group having HIV patients without TB and second group having patients with HIV/TB co-infection) at ART Centers of KMC Attavar Hospital and Government Wenlock Hospital, Mangalore, Karnataka. The study period was of 6 months (July 2015–December 2015). With a power of 80%, 95% confidence interval, a ratio of 1:3 of HIV/TB versus HIV without TB, and 10% nonresponders, the sample size was computed to be 104 (26 HIV/TB co-infected and 78 HIV positives without TB). Inclusion criteria for the study were all HIV positives diagnosed by Integrated Counselling and Testing Centre at least 3 months before enrollment in our study who were above 18 years of age and HIV patients without TB at ART Centers of KMC Attavar and Government Wenlock Hospital and were willing to participate. Exclusion criteria were (i) patients who were not willing to participate, (ii) patients having age <18 years, (iii) all inpatients, patients with AIDS-defining condition other than TB, and patients having chronic illnesses such as hypertension and diabetes mellitus, and (iv) subjects having AIDS-related dementia complex. Nonrandom sampling technique was used. The study was conducted over a period of 2 months using a semi-structured questionnaire to collect clinico-demographic data, World Health Organization QOL (WHOQOL)-HIV BREF^[5]

to assess the QOL, and Beck's Depression Inventory^[6] to identify depression. Institutional Ethics Committee clearance was obtained. All HIV patients with and without active TB were informed about the study, and those who were willing to participate were asked to give the consent and to fill the questionnaire. Data on QOL were collected through face-to-face interview using the short version of the WHOQOL Instrument for HIV clients. This instrument contained 31 items. For each item, there was a five-point Likert scale where 1 indicated low or negative perceptions and 5 indicated high or positive perceptions. These items contained six domains: physical health (4 items), psychological well-being (5 items), social relationship (4 items), environmental health (8 items), level of independence (4 items), and spiritual health (4 items). There were two general questions about general QOL and perceived general health. The physical domain contained information regarding the presence of pain, energy, and sleep. The psychological domain consisted of negative and positive feelings, self-esteem, and thinking. The social domain covered social support, personal relationships, and sexual activity. Mobility, work capacity, and activities were included in the level of dependence. Financial issues, home and physical environment, availability of transport, physical safety and security, and participation in leisure activities were included under the environmental domain. The spirituality domain contained questions about death and dying, forgiveness and blame, and concern about the future. We had also incorporated variables related to sociodemographic factors, having source of income, and family support into the QOL instrument. Data on depression were collected through face-to-face interview using the Beck's Depression Inventory. Clinical information and demographic data were obtained by interviewing the patients, and information about the latest CD4 Count, WHO Stage of the patients was obtained from medical records in the ART centers.

Data analysis and statistics

Data were analyzed using the SPSS version 11.5 software developed by IBM corporation New York, USA. Domain scores in the WHOQOL-HIV were scaled in positive direction with higher score denoting good QoL. Negative questions such as pain and discomfort were recorded so that higher scores reflect better QOL. Mean scores of items within each domain were used to calculate the domain score. Mean scores were then multiplied by 4 to make domain scores comparable with the scores used in the WHOQOL Instrument-100. *t*-test and *F*-test were used to compare means between groups. By taking the mean of each domain as a cutoff point, QOL was dichotomized as poor or good. Mean was used as a cutoff point for physical,

psychological, level of independence, social, spiritual, and environmental domains (because of a normal distribution of scores). Individuals who had score below the mean were classified as having poor QOL. For Beck's Depression Inventory, the score for each of the 21 questions by counting the number to the right of each question which was marked were added. The highest possible total for the whole test was 63. Since the lowest possible score for each question was zero, the lowest possible score for the test was zero. The association of depression with the QOL was assessed.

RESULTS

One-hundred and four HIV patients participated in the study, of which 78 (75%) were HIV-infected patients without TB and 26 (25%) were HIV-TB co-infected patients. All the co-infected patients were having smear-positive pulmonary TB and were in the first 3 months of the antitubercular treatment. Patients having HIV-TB co-infection were more likely to have lower CD4 lymphocyte count as compared to HIV-infected patients without TB ($P = 0.002$). Patients having HIV-TB co-infection were all taking antiretroviral treatment, whereas only 42 HIV patients without TB (53.8%) were taking ART ($P < 0.001$). All HIV-TB co-infected patients are in WHO Stage 3, whereas 64 (82.1%) of HIV patients without TB are in WHO Stage 1 and rest of the patients (17.9%, 14) are in WHO Stage 2 ($P < 0.001$) [Table 1].

In the Beck's Depression Inventory, most of the HIV-infected patients without TB (71.8%) had scores within normal range, whereas most of the HIV-TB co-infected patients (70.8%) had mild mood disturbances. Among co-infected patients, 15.4% had borderline clinical depression. Only 3.8% of HIV-infected patients without TB had the same [Table 1]. HIV-infected patients with TB had a lower mean score in all domains as compared to HIV-infected patients without TB, indicating that HIV-TB co-infected patients had a poor QOL [Table 2]. The Cronbach's alpha was used to measure the internal consistency for each domain of the WHOQOL-HIV instrument. All the domains of the instrument had a high coefficient for internal consistency ($\alpha > 0.7$) except for social health, for which α is 0.69 [Table 3]. Correlations of the various domains of the WHOQOL-HIV showed that there were significantly positive correlations between domains [Table 4].

Physical health

Among HIV-TB co-infected patients, those who had no education were 14 times more likely to have poor

Table 1: Clinic-demographic characteristics of the study population

Variables	HIV/TB co-infected patients (n=26), n (%)	HIV patients (n=78), n (%)	P
Age (years)			
18-27	0	8 (10.3)	0.2
28-37	9 (34.6)	24 (30.8)	
>37	17 (65.4)	46 (59)	
Gender			
Male	17 (65.4)	35 (44.9)	0.07
Female	9 (34.6)	43 (55.1)	
Educational status			
Illiterate	2 (7.7)	2 (2.6)	0.12
Primary school certificate	7 (26.9)	8 (10.3)	
Middle school certificate	10 (38.5)	40 (51.3)	
High school certificate	6 (23.1)	21 (26.9)	
Intermediate or posthigh school diploma	0	6 (7.7)	
Graduate or postgraduate	1 (3.8)	1 (1.3)	
Occupation			
Unemployed	9 (34.6)	27 (34.6)	0.92
Unskilled worker	9 (34.6)	25 (32.1)	
Semi-skilled worker	5 (19.2)	19 (24.4)	
Skilled worker	3 (11.5)	6 (7.7)	
Clerical, shop-owner, farmer	0	1 (1.3)	
WHO staging			
Stage 1	0	64 (82.1)	<0.001
Stage 2	0	14 (17.9)	
Stage 3	26 (100)	0	
CD4 count			
<350	9 (34.6)	51 (65.4)	0.002
≥350	17 (65.4)	27 (34.6)	
Duration of HIV (years)			
<5	19 (73.1)	49 (62.8)	0.34
≥5	7 (26.9)	29 (37.2)	

TB=Tuberculosis, WHO=World Health Organization

Table 2: Comparison of quality of life of HIV patients with and without tuberculosis

QOL domains	Mean (SD)		P
	HIV/TB CO-Infection (n=26)	HIV without TB (n=78)	
Physical health	9.92 (2.03)	12.78 (2.20)	<0.001
Psychological health	10.98 (1.78)	13.18 (2.13)	<0.001
Social health	12.08 (2.03)	13.24 (2.28)	0.02
Environmental health	10.67 (1.76)	13.09 (2.17)	<0.001
Level of independence	9.73 (1.51)	11.41 (2.08)	<0.001
Spiritual health	9.77 (2.26)	12.23 (2.45)	<0.001

TB=Tuberculosis, QOL=Quality of life, SD=Standard deviation

physical health as compared to those who had education (odds ratio [OR] =14). Among HIV infected patients without TB, patients without family support were 1.16 times more likely to have poor physical health as compared to those who had family support (OR = 1.16). HIV-infected patients without TB, who were receiving ART were 2.54 (OR = 2.54) times more likely to have

poor physical health as compared to those who did not receive ART.

Psychological health

HIV-TB co-infected patients who did not have education were 2 times more likely to have poor psychological health as compared to those who had been educated (OR = 2). HIV-infected patients without TB on ART were 1.47 (OR = 1.47) times more likely to have poor psychological health as compared to those who were not on ART.

Level of independence

HIV-TB patients who had not been educated were 2.75 (OR = 2.75) times more likely to have a poor level of independence as compared to those who had been educated.

Social relationship

Among co-infected patients, those not educated were 1.14 times more likely to have a poor social relationship as compared to those who were educated (OR = 1.14). Among HIV-infected patients without TB, those on ART were 2.73 (OR = 2.73) times more likely to have a poor social relationship as compared to those who were not on ART.

Environmental health

In co-infected patients, those who were not educated were 4 times more likely to have poor environmental health as compared to those who were educated (OR = 4). Among HIV-infected patients without TB, those on ART were 3.32 (OR = 3.32) times more likely to have poor environmental health compared to those who were not receiving ART.

Table 3: Internal consistency of the World Health Organization Quality of Life-HIV questionnaire

Domain	Coefficient of internal consistency (Cronbach's alpha)
Physical	0.86
Psychological	0.88
Level of independence	0.78
Social	0.69
Environmental	0.86
Spiritual	0.77

Table 4: Interdomain correlations of the World Health Organization Quality of Life-HIV questionnaire

Domains	Physical	Psychological	Level of independence	Social	Environmental	Spiritual
Physical	1					
Psychological	0.81	1				
Level of independence	0.68	0.76	1			
Social	0.64	0.64	0.71	1		
Environmental	0.79	0.83	0.68	0.64	1	
Spiritual	0.79	0.76	0.60	0.47	0.76	1

Spiritual health

HIV-TB co-infected patients who were not educated were 2.7 times more likely to have poor spiritual health as compared to those who were educated (OR = 2.7). Among HIV-infected patients without TB, those who had no education were 7.37 times more likely to have poor spiritual health as compared to those who had not been educated (OR = 7.37), and those who were on ART were 3.62 (OR = 3.62) times more likely to have poor spiritual health as compared to those who were not on ART.

DISCUSSION

In this study, the QOL of HIV-infected patients without TB was compared with QOL of HIV-TB co-infected patients. The WHOQOL-HIV had very good internal consistency which assessed the QOL of HIV-infected patients with and without TB, which suggests that the instrument had good reliability. The WHOQOL-HIV instrument had significant positive correlation within the domains. In this study, HIV-infected patients with active TB had a poor QOL in all domains as compared to HIV-infected patients without TB. Using Beck's Depression Inventory, it was found that most of the co-infected patients had mild mood disturbances, whereas most of the HIV-infected patients without TB were normal.

In one of the studies done in Ethiopia, depression, having a source of income, and family support were strongly associated with most of the QOL domain.^[7] In our study, education and having ART had association with most of the QOL domains.

Another cross-sectional study conducted in Iran showed that, compared to younger participants, patients older than 35 years had significantly lower scores in overall QOL ($P = 0.003$), social relationships ($P = 0.021$), and spirituality/religion/personal beliefs ($P = 0.024$).^[8] In our study, age group had no significant association with QOL of the patients. Study conducted to assess the impact of HIV/AIDS on QOL of people living in Chitradurga district, Karnataka, showed that the mean scores were highest for psychological domain. QOL was found to be determined by education, income, occupation, ART

status, duration of taking ART, and clinical categories of the disease.^[9] In our study, QOL was found to be determined by only education and ART status. In one of the studies done in North India to determine the impact of HIV/AIDS on the QOL, it was observed that QOL is associated with education, income, occupation, family support, and clinical categories of the patients.^[10] In our study, education and having ART determine the QOL of HIV patients in various domains.

We could not find any association between depression, source of income, occupation, and other socioeconomic characteristics with QOL.

In conclusion HIV-TB co-infected patients were found to have lower CD4 count as compared to HIV-infected patients without TB. All HIV-TB co-infected patients were taking antiretroviral treatment. On comparing the QOL of HIV-infected patients with and without active TB, it was found that HIV-infected patients with TB had poor QOL for all domains of the WHOQOL-HIV instrument (physical health, psychological health, level of independence, social health, environmental health, and spiritual health). The WHOQOL-HIV instrument had a good internal consistency to assess the QOL of our HIV-TB co-infected patients. The instrument had strong interdomain correlation. There was strong association found between the educational status and the QOL among HIV-TB co-infected patients. Among HIV patients without TB, being on ART is one of the determinants of QOL. Having a family support is also one of the predictors of the QOL among HIV patients. There was no association found between depression, source of income, occupation, and other socioeconomic characteristics with QOL.

CONCLUSION

1. TB is one of the leading causes of death among people living with HIV in the world
2. To improve the QOL of HIV-infected patients, it is crucial to identify the determinants QOL
3. HIV-infected patients with active TB had poor QOL

as compared to HIV-infected patients without TB in all domains of the WHOQOL-HIV instrument

4. Education, family support, and ART status were found to be strongly associated with QOL
5. Depression was not found to be associated with QOL of HIV-infected patients
6. Interventions are required to improve the QOL by maximizing education and family support in community.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. India HIV and AIDS Statistics; 2014. Available from: <https://www.avert.org/professionals/hiv-around-world/asia-pacific/india>. [Last accessed on 2018 Apr 17].
2. India saw most Number of Tuberculosis Deaths, Patients in 2016: WHO Report; 2016. Available from: <https://www.hindustantimes.com/health/india-saw-most-number-of-tuberculosis-deaths-patients-in-2016-who-report/story-2itBX7TvuDskjhTkFSCSXK.html>. [Last accessed on 2018 Apr 17].
3. Sahay S, Reddy KS, Dhayarkar S. Optimizing adherence to antiretroviral therapy. *Indian J Med Res* 2011;134:835-49.
4. Pawlowski A, Jansson M, Sköld M, Rottenberg ME, Källenius G. Tuberculosis and HIV co-infection. *PLoS Pathog* 2012;8:e1002464.
5. Clarifying the WHOQOL-HIV and WHOQOL-HIV-Bref Instruments. Available from: <http://www.cdn.intechweb.org/pdfs/22273.pdf>. [Last accessed on 2018 Jan 20].
6. Beck AT. Beck's Depression Inventory. Available from: <http://www.cawt.com/Site/11/Documents/Members/Evaluation/BeckDepressionInventory1.pdf>. [Last accessed on 2018 Jan 20].
7. Deribew A, Tesfaye M, Hailmichael Y, Negussu N, Daba S, Wogi A, et al. Tuberculosis and HIV co-infection: Its impact on quality of life. *Health Qual Life Outcomes* 2009;7:105.
8. Razavi P, Hajifathalian K, Saedi B, Esmaeeli Djavid G, Rasoulinejad M, Hajiabdolbaghi M, et al. Quality of life among persons with HIV/AIDS in Iran: Internal reliability and validity of an international instrument and associated factors. *AIDS Res Treat* 2012;2012:849406.
9. Rajeev KH, Yuvaraj BY, Nagendra Gowda MR, Ravikumar SM. Impact of HIV/AIDS on quality of life of people living with HIV/AIDS in Chitradurga district, Karnataka. *Indian J Public Health* 2012;56:116-21.
10. Wig N, Lekshmi R, Pal H, Ahuja V, Mittal CM, Agarwal SK, et al. The impact of HIV/AIDS on the quality of life: A cross sectional study in North India. *Indian J Med Sci* 2006;60:3-12.