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Original Article

A Cross-Sectional Study on Quality of Life Among HIV/AIDS Patients in Relation to CD4 Count in North India

Dr Ankita Sharma[1], Dr Kiran K[2], Dr Kripashankar Nayak[3], Dr Kapil Gupta[4], Dr Jyoti Mehra[5]

[1]Assistant Professor, Department of Community Medicine, Naraina Medical College and Research Centre, Panki, Kanpur, UP

[2]Assistant Professor, PES University Institute of Medical Sciences and Research, Bengaluru.

[3]Associate Professor, Department of Community Medicine, Autonomous State Medical College, Tiloi, Amethi, UP.

[4]Senior Resident, Sukh Sagar Medical College & Hospital, Jabalpur, MP.

[5]Associate Professor, Department of Community Medicine, Autonomous State Medical College, Tiloi, Amethi, UP.

Corresponding Author:

Dr Ankita Sharma
Assistant Professor, Department of Community Medicine, Naraina Medical College and Research Centre, Panki, Kanpur, UP
Email: doctorankita8@gmail.com

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ABSTRACT

Background: With the recent advances in clinical tests and treatments for those suffering from HIV/AIDS, the survival of these patients has been increased and their quality of life has become an important focus for researchers and healthcare providers. HIV affects the CD4 cells and CD4 count is the basis on which the ART treatment is started. Thus the aim of the study was to assess the Quality of life in HIV/AIDS patients in relation to CD4 count in Etawah district.

Methodology- The present study was a cross-sectional study performed among the 140 people living with HIV/AIDS attending ART centre tertiary care facility, Saifai, Etawah. The participants were interviewed at the time of registration by using pre tested questionnaire using full version of world health organization quality of life HIV instrument (WHOQOL-HIV) after getting informed consent. Information regarding Socio-demographic variables was taken and Quality of Life assessed by full version of WHOQOL-HIV. CD4 count of the participants was assessed at the start of antiretroviral therapy.

Results: Majority of the subjects were Male 80 (57.1%) and 93 (65.7%) were married. Out of them, 58 (41.4%) of the study participants had CD4 count between 200-500. Highest mean score was observed in SRPB domain (14.69±2.10) whereas lowest was found in psychological domain (13.54±2.08). It was observed that the participants having CD4 count >500 cells/mm3 had good mean scores in every HR-QOL domains in compare to those participants who had CD count <500 cells/mm3 and this was found to be significant in level of independence domain.

Conclusion: Quality of Life of HIV patient is influenced to a great extent by CD4 Count. The ultimate goal for treatment is not only to promote longevity but also to enhance quality of life. So every effort should be made to increase the CD4 count of HIV patients.

Keywords: *HIV/AIDS, CD4 count, Quality of life (WHOQOL-HIV, Antiretroviral therapy (ART), Cross-sectional study.*

INTRODUCTION

Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) is a spectrum of conditions caused by Human immunodeficiency virus. It has a chronic debilitating course that affects not only the patients' physical condition, but also their social relations, mental health and financial aspects.Since its discovered in 1981, AIDS has become a major health problem worldwide.[1]

According to UNAIDS, there were approximately 36.9 million people worldwide living with HIV/AIDS at the end of 2017. An estimated 1.8 million individuals worldwide became newly infected with HIV in 2017, accounting for about 5,000 new infections per day.[2]Currently only 60% of people with HIV know their status. The remaining 40% (over 14 million people) still need to access HIV testing services.[3]

As per recently released, India HIV Estimation 2017 report, National adult HIV prevalence in India is estimated at 0.22% in 2017. The estimated prevalence among males is 0.25% and 0.19% among Females. The adult HIV prevalence at national level has continued its steady decline from an estimated peak of 0.38% in 2001-03 to 0.22% in 2017. The total number of people living with HIV (PLHIV) in India is estimated at 21.40 lakhs in 2017.[4]

Effective treatment with antiretroviral drugs can control the virus so that people with HIV can enjoy healthy lives and reduce the risk of transmitting the virus to others. Prevention has helped to reduce HIV prevalence rates in a small but growing number of countries and new HIV infections are believed to be on the decline. In addition, the number of people with HIV receiving treatment in resource-poor countries has dramatically increased in the past decade.[5]

Wellbeing is a concept that has objective and subjective and components. The subjective component of wellbeing (as expressed by each individual) is attributed to as 'Quality of life (QOL)'.[6]The World Health Organization has defined quality of life as "*individuals' perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns*".[7] But in some situations like when a person is affected by a chronic debilitating illness like HIV/AIDS, all these things change and living becomes not so normal. Being HIV positive can amend an individual's quality of life dramatically in all aspects.

Best predictor of disease status and immediate risk of death is CD4 count and thus should be used to identify those who have advanced HIV disease. All patients entering or re-entering care should receive a CD4 test at treatment baseline and as clinically indicated for patients who are unstable or with advanced HIV disease. It is strongly recommended that patients with advanced HIV disease (CD4 count below 200 cells/mm^3) receive a package of care as definedin the 2017 WHO Guidelines for managing advanced HIV disease and rapid initiation of antiretroviral therapy.[8]

Concern about Quality of life is a very important issue now-a-days especially in those type of patients who are suffering from this chronic debilitating disease which has no cure but side by side regular therapy prolonging their life. Based on the aforesaid observation, the present study was conducted. Thus the aim of this study was to assess the Quality of life of the HIV/AIDS patients going to receive ART along with a specific objective, to find out the effect of CD4 count on their quality of life.

METHODOLOGY:

Study settings and design: This was a cross-sectional study conducted during June 2018 to June 2019, based on a convenient sample of 140 newly registered people living with HIV/AIDS (PLHA) at ART centre of UPUMS, Saifai, Etawah who are going to start ART therapy.

Study population: Study participants included PLHA above 18 to 70 years of age. PLHA were approached and explained about the objectives of the study in local language (Hindi) and written consent was obtained from the PLHA who were willing to participants in the study.

Data collection: Face to face interview was conducted and data collected on socio–demographic characteristics like age, sex, place of living, place of working, religion, caste, education, occupation and socio-economic status was elicited using pre-structured, pretested questionnaire. CD4 count was obtained by ART card of patient. Patient's privacy and confidentiality was maintained. The average duration of interview was about 25 minutes.

Their quality of life was assessed at baseline (before starting ART) using full version of world health organization quality of life HIV instrument (WHOQOL-HIV). The full version includes 120 questions related to various aspects of quality of life. It comprises of 6 domains and 29 facet scores, and one general facet score measures overall quality life and general health. Five of these facet scores are specific to HIV/AIDS.Six domains are physical, psychological, level of independence, social relationships, environmental and spirituality domain. Individual items are rated on a 5 point Likert scale where 1 indicates low, negative perception and 5 indicates high, positive perceptions. As such, domains and facet scores are scaled in a positive direction where higher scores denote higher quality of life. Some facets (pain and discomfort, negative feelings, dependence on medication, death and dying) are not scaled in a positive direction, meaning that for these facets higher scores do not indicate higher quality of life.[9]

Data analysis: The Data was analysed using Statistical Package for Social Sciences (SPSS V- 24.0). The domain's mean scores were calculated using WHO user manual on how to score and code WHOQOL-HIV instruments. Domain scores were scaled in a positive direction where higher scores denote higher HR-QOL. Some items like dependence on medication and death pain were scaled in a negative direction, meaning that for these facets higher scores do not denote higher HR-QOL. These items were reversed so that high scores reflect better HR-QOL. Hence, the formula 6-x was used. The descriptive variables such as mean, standard deviation were used. One-way analysis of variance (ANOVA) was used to check the difference among CD4 count regard to domains of HR-QOL and various domains Pearson's co-efficient was also estimated. Level of significance was established at 5% and considered statistically significant when $p < 0.05$.

Ethical approval: The protocol was approved by the Institutional Ethics Committee (IEC) at Uttar Pradesh University of Medical Sciences, Saifai, Etawah, prior to the commencement of the study.

RESULTS:

In the study, a total 140 PLHA were included. The average age of the study participants was 34.76±11.81 years and 80 (57.1%) of them were male, 93 (65.7%) were married and 63 (45%) had at least secondary education. Out of them, 74 (52.9%) were employed and 59 (42.1%) were belong to lower-middle class. Majority of the patients 58 (41.4%) were having their CD4 count in between 200-500/mm^3. A sizable proportion (29%) of the patients had CD4 count below 200/mm^3 and 29% of them had CD4 count >500/mm^3 (table 1 & 2).

Table 1: Characteristics of study participants

S. no.	Profile	No (%)
1.	**Total number of participants**	140 (100)
	Mean age	34.76±10.98
	Male	80 (57.1)
	Female	60 (42.9)
2.	**Marital status**	
	Unmarried	19 (13.6)
	Married	92 (65.7)
	Divorced	04 (2.8)
	Widowed	25 (17.9)
3.	**Education**	
	Illiterate	33 (23.6)
	Primary school	17 (12.1)
	Secondary school	63 (45.0)
	Higher school	08 (5.7)
	Graduation	11 (7.9)
	Post-graduation	08 (5.7)
4.	**Employment status**	
	Yes	74 (52.9)
	No	66 (47.1)
5.	**Socioeconomic status**	
	Upper class	09 (6.4)
	Upper-middle class	12 (8.6)
	Middle class	26 (18.6)
	Lower-middle class	59 (42.1)
	Lower class	34 (23.3)

Table 2: Distribution of study participants according to their CD4 count

S. no.	CD4 count	Number (%)
1.	<200	41 (29.28)
2.	201-500	58 (41.44)
3.	>500	41 (29.28)
Total		**140 (100)**

A positive correlation was seen between HR-QOL and CD4 count with value of correlation coefficient to be **0.31** and this is shown in Figure 1, this correlation was statistically significant with $P < 0.05$. There was significant positive correlation between CD4 cell count and domains of WHO HR-QOL except in SRPB domain. With level of independence domain showing highest positive correlation with CD4 count and least was seen with SRPB domain.

Table 3: Correlation between the CD4 cell count and quality of life domains

S. no.	WHO QOL domains	CD 4 count	
		Correlation coefficient	p-value
1.	Physical	0.261	**0.02**
2.	Psychological	0.255	**0.02**
3.	Level of independence	0.290	**0.01**
4.	Social relationship	0.202	**0.01**
5.	Environment	0.236	**0.005**
6.	Spirituality/religion/personal beliefs	0.062	0.468

7.	General	0.277	**0.001**

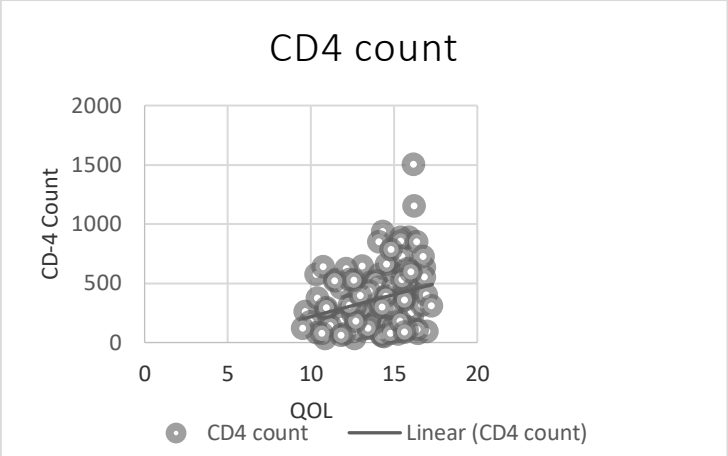

Figure 1: Correlation between QoL and CD4 count

Table no. 4 depictsthe overall domain scores and it was found in physical, level of independence and SRPB domain (14.30, 14.63 & 14.69 respectively) showed increased quality of life when compared to other domains such as psychological, social and environment which all ranged from 13.54 – 13.82.

Table 4: Distribution of different domains of quality of life in terms of mean and standard deviation

S. No.	Domain	Mean±SD	Minimum-Maximum
1.	Physical	14.30±2.86	7.50-18.75
2.	Psychological	13.54±2.08	8.60-17.20
3.	Level of independence	14.63±3.00	7.75-18.75
4.	Social relationship	13.82±1.88	7.25-16.75
5.	Environment	13.69±1.44	9.62-16.75
6.	Spirituality/Religion/Personal beliefs	14.69±2.10	8.50-19.00
7.	General	3.25±0.87	1.25-4.75

Table no. 5 shows the comparison of HR-QOL of participants according to CD4 count at baseline. It was observed that the participants having CD4 count >500 cells/mm^3 had good mean scores in every HR-QOL domains in compare to those participants who had CD count <500 cells/mm^3 and this was found to be significant only in level of independence domain.

Table 4: Comparison of HR-QOL of Participants according to CD 4 count

Variables	Domain I Mean(SD)	Domain II Mean(SD)	Domain III Mean(SD)	Domain IV Mean(SD)	Domain V Mean(SD)	Domain VI Mean(SD)
<200 (n=41)	13.60 (2.96)	12.94 (2.21)	13.57 (3.38)	13.46 (1.89)	13.34 (1.30)	14.59 (2.40)
201-500 (n=58)	14.25 (2.62)	13.63 (1.95)	14.87 (2.71)	13.75 (2.01)	13.80 (1.42)	14.70 (2.03)
>500 (n=41)	15.06 (2.97)	14.02 (2.03)	15.35 (2.76)	14.28 (1.61)	13.87 (1.56)	14.77 (1.90)
ANOVA p Value	0.071	0.060	**0.019**	0.135	0.179	0.924

Domain I- Physical domain, Domain II- Psychological, Domain III- Level of independence, Domain IV- Social relationship, Domain V- Environment, Domain VI- Spirituality/religion/personal belief

DISCUSSION:

In the present study, mean age of the study participants was 34.76±10.98 years. This reflects that majority of the participants were in sexually active period of their life. This finding can be compared with some other studies on HIV/AIDS patients.

Among them, Nojomi et al found that the mean age as 35.4±6.4 years [10] whereas Gebremichael DY et al conducted study on HIV/AIDS patients in Ethiopia and the mean age was found as 38.5±8.5 years.[11]

Male dominance, in the overall number of HIV/AIDS people was shown in the study of Nojomi et al (88.5%),[10] and also in the study of Xu JF et al (68.1%)[12]. In the present study also, male proportion was found to be higher.

In our study, the mean score was found highest in SRPB domain. Similar result was found in the study of Chatterjee S et al.[13] This suggests that people generally tend to be more spiritual and religious when confronted with issues that are beyond them. Greater level of spirituality in PLHA were associated with health outcomes such as fewer mental problems, fewer reported HIV related symptoms and better overall QOL in PLHA.

We have found that patients with higher CD4 count had better quality of life than patients with lower CD4 count and it was found significant in level of independence domain. In a cross-sectional study done in Mysore district also found that QOL were significant higher among persons with higher CD4 count.[14] In a study Quality of life in HIV/AIDS patients attending the ART clinic in Delhi, it was found that QOL scores were significantly lower among persons with lower CD4 count.[15] Assessment of Quality of life of people living with HIV/AIDS in Sao Paulo, Brazil, Subjects with CD4 cell counts below 200 cells/mm3 had lower QOL scores.[16] Health-Related Quality of Life (HR-QOL) in 154 individuals infected with HIV in London hospital recorded low levels of HR-QOL compared with the general population. Lower CD4 counts were associated with lower HR-QOL scores.[17]

It has been seen that better nutrition, education, higher socioeconomic status, and employment is associated with higher CD4 count.[18,19,20,21,22] The paramount goal for treatment is not only to foster longevity but also to enhance the QoL. Strategies developed to encourage communication with a good health care support system may result in potentially higher QoL outcomes. So every attempt should be made to increase the CD4 count of HIV patients.

The challenges in improving quality of life of HIV-infected people in rural areas are lack of economic assistance and treatment availability. Lack of education and knowledge among the patients is also one of the major barrier in improving their quality of life.

Some limitations of the present study should be noted. Study results might not represent the general population as study done in ART centre of tertiary care centre. It was not feasible to conduct in a community. The study was restricted to HR-QOL from patient's perspective. The other aspect of HR-QOL and objective evaluation, it was not considered for the study. Some of questions in our study were leading to non-responsive and less reporting of sexual behaviour

CONCLUSION:

Present study concluded that CD4 count has a significant effect over quality of life of HIV/AIDS patients. CD4 count is a precise status of immunological status of patients. The downfall of CD4 count is closely associated to many opportunistic infections which may eventually harm the physical health and other aspects of quality of life. So, the goal should be to maintain the CD4 count of HIV/AIDS patients in a higher level by reducing viral replication with strict and regular monitored Antiretroviral therapy.

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