

A Correlation Study Between QOL and CD4 Cell Count of HIV Positive Patients Attending VCTC, Vizianagaram Andhra Pradesh, India.

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Abstract: Immunological markers (CD4 count) are used in developing countries to decide on initiation of antiretroviral therapy and monitor HIV/AIDS disease progression. HIV is an incurable chronic illness, making quality of life paramount. The direct relationship between quality of life and CD4 count is unclear. The purpose of this study is to determine the relationship between CD4 count clinical staging and quality of life of people living with HIV. The **objectives** of the study were. To correlate the QOL and CD4 cell count among HIV positive patients attending VCTC, To associate between the QOL and CD4 cell count of HIV positive patients and selected back ground variables. The **methodology** of the study A Quantitative descriptive study design was adopted and selected 60HIV positive patients by using convenient sampling technique on those who are attending VCTC (voluntary counselling and testing center) in Govt. District Hospital Vizianagaram. The researcher used an interview schedule to collect demographic and clinical data and modified the WHO QOL HIV BREF SCALE to assess the Quality of Life of HIV-positive patients from May 2017 to July 2017. CD4 count was identified using Cyflowmetry and Clinical staging of HIV infection was assessed using the checklist. The data were analysed by using descriptive and inferential statistics. The study concluded that there was a strong relationship between quality of life, CD4 count, and the clinical staging of HIV-positive patients. The CD4 cell count can help health care provider to plan appropriate treatment and plan of care.

Keywords: Immunological, CD4 cells, HIV, demographic

Introduction:

Quality of life is a complex and multi-dimensional concept. It is conceptualised in terms of "an absence of pain or an ability to function in day-to-day life". The fifth leading cause of death among people aged 25–44 in the United States is AIDS. The World Health Organization (2018) states that one of the most threatening communicable killer diseases of the 21st century is acquired immunodeficiency syndrome (AIDS). WHO recommends that every person who may be at risk of HIV should access testing. HIV continues to be a major global public health issue, having claimed 36.3 million lives so far[1]. There is no cure for HIV infection. However, with increasing access to effective HIV prevention, diagnosis, treatment, and care, including for opportunistic infections, HIV infection has become a manageable chronic health condition, enabling people living with HIV to lead long and healthy lives. HIV infection can be detected using simple and

inexpensive rapid diagnostic tests, as well as self-tests. The human immune system protects your body by fighting germs (such as viruses, bacteria, or fungi) and infections. White blood cells are an important part of the immune system. HIV infects and destroys a type of white blood cell called a CD4 cell (sometimes called a T-cell or, more specifically, a CD4 T-cell). As the immune system loses CD4 cells, the body becomes weaker and is less able to fight off germs. When it loses a large number of CD4 cells, people living with HIV are at risk of getting AIDS-related opportunistic infections (OIs), which can cause serious illness or death. The number of CD4 cells in your body shows the health of your immune system. A normal CD4 cell count is about 500 to 1,500 cells per cubic millimetre of blood (a cubic millimetre is a very small amount, about one drop). The number of CD4 cells a person has and their CD4 count usually decrease as HIV disease gets worse[3].

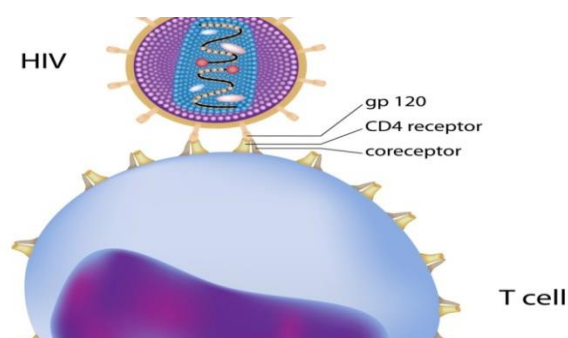


Fig 1 CD4 cell structure

The WHO system for adults sorts patients into one of four hierarchical clinical stages ranging from stage 1 (asymptomatic) to stage 4 (AIDS). Patients are assigned to a particular stage when they demonstrate at least one clinical condition that meets that stage's criteria. In Stage 1, Patients who are asymptomatic or have persistent generalized lymphadenopathy at least two sit for longer than 6 months are classified as being in stage 1, where they may remain for several years.

In Stage 2 in early HIV infection, patients may demonstrate several clinical manifestations. Clinical findings included in stage 2 are unexplained weight loss of less than 10 percent of total body weight and recurrent respiratory infections such as sinusitis, bronchitis, otitis media, and pharyngitis, as well as a range of dermatological conditions including herpes zoster flares, angular cheilitis, recurrent oral ulcerations, eruptions.

In Stage 3, as the disease progresses, additional clinical manifestations may appear. Those encompassed by the WHO clinical stage 3 (the moderately symptomatic stage) category are weight loss of greater than 10 percent of total body weight, prolonged (more than 1 month) unexplained diarrhea, pulmonary tuberculosis, and severe systemic bacterial infections, including pneumonia, pyelonephritis, empyema, pyomyositis, meningitis,

bone and joint infections, and bacteremia. Mucocutaneous conditions, including recurrent oral candidiasis, oral hairy leukoplakia, and acute necrotizing ulcerative stomatitis, gingivitis, or periodontitis, may also occur at this stage. Stage 4. The WHO clinical stage 4 the severely symptomatic stage designation includes all of the AIDS-defining illnesses. Clinical manifestations for stage 4 disease that allow a presumptive diagnosis of AIDS to be made based on clinical findings alone are HIV wasting syndrome, Pneumocystis pneumonia (PCP), recurrent severe or radiological bacterial pneumonia, extrapulmonary tuberculosis. These categories apply to adults and adolescents 15 years of age and older. The HIV/AIDS epidemic clearly has broad and significant implications for individuals living around the globe. Populations in developing nations are especially hard-hit by HIV infection and, at the same time, frequently lack access to technological advances and other resources for diagnosing and managing care[7].

Screening strategies, such as the WHO Clinical Staging System, allow for efficient identification of early infections and aggressive management when clinicians are equipped with the knowledge to apply them and can therefore be useful tools for improving access to and implementation of care[2].

Classification of Clinical Staging	Range of CD4 count cells/mm ³
Stage I- Asymptomatic	CD4 > 500
Stage II- Early Symptomatic	CD4> 350-500
Stage III - Moderately Symptomatic	CD4 200-350
Stage IV- Severely Symptomatic	CD4 <200

OBJECTIVES:

1. To correlate the QOL and CD4 cell count among HIV positive patients attending VCTC.

2. To associate between the QOL and CD4 cell count of HIV positive patients and selected back ground variables

Materials and Methods

Study participants

The research approach adopted, research design the design adopted for the present study is a descriptive study. The target population for the study was the HIV-positive patient registered to attend VCTC under the Vizianagaram AIDS Control Society. Totally, 14,000 HIV-positive people had registered in Vizianagaram. Among them, 13000 were registered in the VCTC, the government district hospital in Vizianagaram. Out of them, 11,000 were utilising the services. The inclusion criteria for this study were: patients with HIV/AIDS with an age above 18 years, only patients residing in Vizianagaram with the diagnosis of HIV/AIDS, only patients living with HIV/AIDS receiving anti-retroviral therapy at VCTC, Vizianagaram. And exclusion criteria such as the pediatric group, HIV positive pregnant women, and HIV positive patients with neurological complications. HIV-positive patients in the age group above 18 years attending VCTC in Government District Hospital, Vizianagaram, were the samples. The sample size of the present study consisted of 60 HIV-positive patients. Samples were determined using power analysis. 60 samples that met the selection criteria were selected using the purposive sampling technique. During the data collection period, samples that satisfied the inclusive criteria. Every day an average of 6–8 samples were selected using the lottery method. The study was conducted at the VCTC in the Government District Hospital, Vizianagaram. The services rendered by VCTC are registration of HIV diagnosed cases, checking CD4 counts and blood investigations in laboratories, health assessments, and monthly up and check-ups. Around 11000 patients are utilizing the services of the VCTC, which is well run by an efficient medical team under the direct control of the Vizianagaram AIDS Control Society (VACS), Vizianagaram. The staffing pattern of VCTC is one chief medical officer, two nurses, one lab technician, one counselor, one pharmacist, one statistician, two nursing assistants, and one attender. VCTC is very accessible to the subject, having basic facilities like a separate room for counseling, a dormitory, and separate toilets for males and females.

Data collection

The data were collected from HIV-positive patients attending the VCTC Government District Hospital, Vizianagaram, from May 2017 to July 2017. After

enrollment, the data were collected by using a questionnaire and a structured interview on demographic variables like age in years, gender, residential area, place of living, religion, type of family, order of birth in the family, educational status, occupational status, pattern of work, type of income group, marital status, number of children, dietary pattern, personal habits, and source of health information. and clinical variables like duration of illness (HIV infection) in years, source of infection, opportunistic infection, comorbid illness, self-perceived health status, the health status of a spouse, and the health status of children. And also on the clinical staging of HIV as per WHO guidelines based on the presence and absence of the clinical conditions like asymptomatic, chronic fever, chronic diarrhoea, weight loss, wasting syndrome, and opportunistic infection. Identification of CD4 count is analysed using the Cyflowmetry technique by the technician in the laboratory situated in the ART Center in Government District Hospital, Vizianagaram.

Statistical analysis

During the pre-test, the demographic and clinical variables were noted, the staging was assessed by using a checklist, and QOL was evaluated using the WHOQOL-BREF Scale during their first visit through an interview technique and samples were sent to the lab at the ART centre for analysis of CD4 counts. It took 3 months to complete 60 samples for one set of work in the data collection on quality of life, CD4 analysis and staging. At the end of the data collection work, handouts were also distributed to the samples in the control group for their healthy lifestyles.

Ethical Approval of study

Formal permission was obtained from the medical superintendent of the government district hospital, Vizianagaram, the project director of the district AIDS control society, Vizianagaram, and the chief medical officer of the VCTC in the government district hospital, Vizianagaram. The purpose of the study was explained to each one of the samples. An individual informed consent duly signed by the samples' subjects was obtained. The principles of anonymity and confidentiality were strictly followed throughout the study. After the completion of data collection work at the VCTC in the Government District Hospital at Vizianagaram, handouts were distributed to the samples in the control group for their well-being.

Results

Table 1 compares the level of CD4 count and staging with QOL among HIV positive patients

N=60

Level of CD4 count	Experimental		Chi square test
	N	%	
Severely symptomatic stage IV	0	0.00%	$\chi^2=8.04$ P=0.05* DF=3 significant
Moderately symptomatic stage III	7	23.33%	
Early symptomatic stage II	11	36.67%	
Asymptomatic stage I	12	40.00%	
Total	30	100%	

P≤0.001 very high significant

Above table 1 compares the level of CD4 count and staging with QOL among HIV positive patients. Statistically there is a significant difference between

quality of life and cd4 cell count and staging. Level of CD4 count was calculated using chi-square test. .

Table-2 Correlation between QOL score and CD4 count among Experimental group among HIV positive patients.

N=60

Correlation between	Mean score Mean±SD	Karl Pearson Correlation coefficients	Interpretation
QOL score vs. CD4 count	129.57±37.50 581.34±291.15	r = 0.44 P=0.001***	Moderate correlation

Table 2 reveals that there is a significant positive correlation between QOL score and CD4 count staging among HIV patients. there is a significant positive moderate correlation between QOL score and CD4 count among HIV patients. It means their QOL score increases and their CD4 count increases moderately.

Interpretation for r-value

Karl pearson correlation coefficient is denoted by “r”

“r” always lies between -1 to +1

0.0 – 0.2 poor correlation

0.2 - 0.4 fair correlation

0.4 - 0.6 moderate correlation

0.6 – 0.8 substantial correlation

0.8 - 1.0 strong correlation

The figures 2, compare the staging of CD4 count and QOL the patients have 7.00% of the patients had a severely symptomatic stage IV level of CD4, 24.00% of them had a moderately symptomatic stage III level of CD4 count, 28.33% of them had an early symptomatic stage III level of CD4 count, and 40.67% of them had an asymptomatic stage I level of CD4 count. CD4 cell counts are calculated using the Extended McNemar’s test.

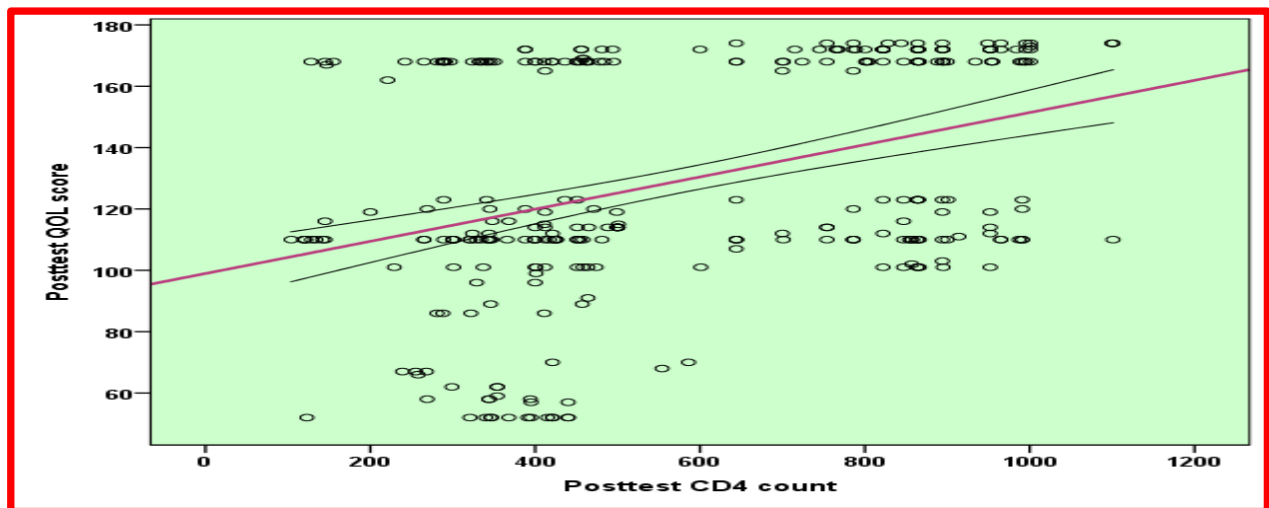


Fig-2 Scatter diagram with regression estimate shows the moderate positive ($r=0.44$ $P\leq 0.001$) correlation coefficient between the quality of life score and CD4 count score among HIV positive patients

Table 3 Association between Demographic variables and CD4 count staging among HIV positive patients

N=60

Demographic variables		QOL score				n	Chi square test
		Stage3&4		Stage1&2			
		n	%	n	%		
Age	25-35 years	13	59.09%	9	40.91%	22	$\chi^2=5.11$ $p=0.02^*(S)$
	>35 years	1	12.50%	7	87.50%	8	
Education	Primary school level	10	71.43%	4	28.57%	14	$\chi^2=6.46$ $p=0.01^{**}(S)$
	Above primary level	4	25.00%	12	75.00%	16	
Personal habit	No	5	29.41%	12	70.59%	17	$\chi^2=4.69$ $p=0.03^*(S)$
	Yes	9	69.23%	4	30.77%	13	
Opportunistic infection	None	7	31.82%	15	68.18%	22	$\chi^2=7.30$ $p=0.01^{**}(S)$
	With infection	7	87.50%	1	12.50%	8	

DF= Degrees of Freedom S= significant NS= not significant

$P\leq 0.05$ significant $P\leq 0.01$ highly significant $P\leq 0.001$ very high significant

$P>0.05$ not significant

Above table shows the association between Demographic variables and post-test CD4 score among experiment group of HIV patients. >35 years aged patients, Above primary patients, no personal habits and no Opportunistic infection are having more moderate/good level of QOL than others.

Statistical significance was calculated using chi square test.

Discussion

It is observed that Statistically there is a significant difference between quality of life and cd4 cell count and staging at $P=0.05$ Level of CD4 count was calculated using chi-square test when compares the level of CD4 count and staging with QOL among HIV positive patients. The mean QOL score of 129.57 with a standard deviation of ± 37.50 , Karl Pearson Correlation coefficients $r=0.44$ $P=0.001$ shows moderate correlation. $P=0.001$ stating

that there was a significant relationship found between CD4 count clinical staging and quality of life. Hence, the stated research hypothesis (H1) was accepted.

The association between Demographic variables and post-test CD4 score among experiment group of HIV patients. >35 years aged patients, above primary patients, absence of personal habits and absence of Opportunistic infection are having more moderate/good level of QOL than others. Statistical significance was calculated using chi square test. Thereby, the research hypothesis H2 there is a significant association between CD4 cell count and staging of HIV positive patients and their selected demographic variables.

Conclusion

The study concluded that there was a strong relationship between quality of life, CD4 count, and the clinical staging of HIV-positive patients. There was also a significant association between quality of life and age, order of birth in the family, educational status. This study also concluded that there was a significant association between quality of life and clinical variables namely, duration of illness (HIV infection), opportunistic infection.

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