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Original Research Article

Nutritional impact on quality of life among people living with HIV/AIDS: An observational study

Harish Ganesan¹, Shivkumar Gopalakrishnan M D², K Velmurugan¹,
K Sangeetha M D^{3,*}¹The Tamilnadu Dr. MGR Medical University, Chennai, Tamil Nadu, India²Dept. of Medicine, The Tamilnadu Dr. MGR Medical University, Chennai, Tamil Nadu, India³Dept. of Biochemistry, The Tamilnadu Dr. MGR Medical University, Chennai, Tamil Nadu, India

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ABSTRACT

Background: Limited evidence exists about the relation between nutrition, and quality of life among PLHIV. The study aimed to estimate the prevalence of under-nutrition, identify risk factors and assess correlations with PLHIV and their quality of life. The proper implementation of nutritional support and its integration with the highly active antiretroviral therapy package demands a clear picture of the magnitude and associated factors of malnutrition. The objective of this study is to assess the prevalence and factors associated with malnutrition among PLHIV.

Methodology: Institutional based observational study conducted on PLHIV. Anthropometry indices and biochemical parameters such as serum total protein, serum albumin, serum globulin, albumin: globulin ratio and CD4 cell count were analyzed and expressed as Mean \pm standard deviation and p value less than 0.05 was considered to be significant.

Result: This study contained 208 PLHIV with almost equal proportion of both the gender. It was found that the males had better BMI than females. The mean serum total protein levels, mean albumin levels and CD4 cell count were lower than the normal range showing impaired nutritional status of PLHIV. It was also found that there was direct correlation between serum albumin levels and CD4 cell count.

Conclusion: Nutritional status was found to be positively correlated with quality of life. The results prove that the existing care for PLHIV is impaired for their well-being. Nutritional support should form a fundamental part of treatment for PLHIV, including more efforts.

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1. Introduction

Human immunodeficiency virus (HIV) is a lentivirus that causes HIV infection which progresses to acquired immunodeficiency syndrome (AIDS) over time. This life-long infection targets and alters the immune system, affect mental health and malnutrition, resulting in increased susceptibility to opportunistic infections.¹

India has the third-largest HIV epidemic in the world. About 37.7 million people living with HIV (PLHIV) across the global and India accounts to about 23.19 lakh in 2020. Overall, there was an estimate of 1,721 PLHIV per million people in 2020 in India.^{2,3} It is important in our health care system to maintain the quality of life of PLHIV, as the disease affects the physical, mental and social status of patients. Even after immense care by our health care system, people suffer due to reasons are chronic gastroenteritis, alteration in intestinal barrier function, inflammatory mediators reducing appetite, increased resting

* Corresponding author.

E-mail address: sangeetha6482@gmail.com (K. Sangeetha M D).

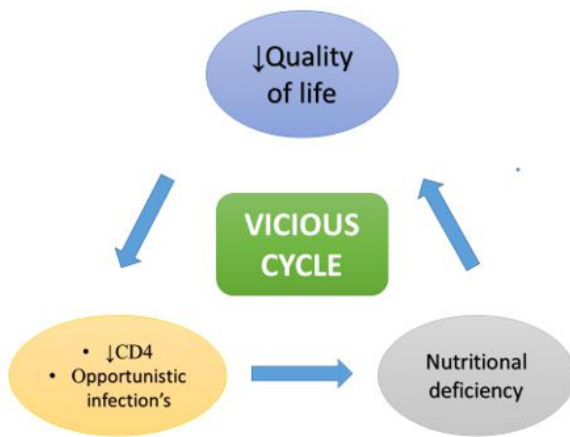


Fig. 1: Vicious cycle for HIV

metabolic rate.

Moreover, due to poor socioeconomic status and the prevailing social stigma, the people living with HIV undergo much psychosocial problems and depression. Secondary symptoms such as nausea, vomiting, diarrhea is witnessed due to initiation of Anti-Retroviral Therapy (ART). Poor nutritional status in PLHIV speeds the disease progression, reduces survival time and increases morbidity even when ART is available.^{4,5}

Nutrition is the practice or science of consuming and utilizing foods. It is the supply of materials required by organisms and cells to stay alive. An unhealthy diet can cause deficiency-related diseases such as anemia, blindness, scurvy, stillbirth, preterm birth, and cretinism⁶ or health-threatening conditions due to excess nutrients such as obesity^{7,8} and metabolic syndrome;⁹ and common chronic systemic diseases such as cardiovascular disease. Undernutrition can lead to wasting in acute cases and the stunting of marasmus in chronic cases.⁶

Receiving appropriate nutrition can help improve PLHIV's quality of life (QoL) and antiretroviral absorption and tolerance. Good nutrition for PLHIV has been proven to increase resistance to infection, maintain weight, and improve QoL, drug efficacy and drug compliance.^{10,11} For these reasons, nutritional support should be a fundamental part of a comprehensive response to HIV and AIDS.¹²

The self-care practices have been modulated by kin and non-kin social network relationships. PLHIV treatment-seeking behavior were influenced by relationships with friends or family members and some formal health care providers. Limited disclosure of HIV status to close and trusted friends and family members as well as formation of or belonging to informal networks of PLHIV facilitated coping and self-management of HIV.

The second form of social support is provided through religious groupings and networks with other PLHIV

involved psychosocial support. In addition, PLHIV also provide informational support to each other on illness management.¹³

2. Aim

To study the nutritional impact on quality of life among people living with HIV/AIDS.

3. Objectives

1. To measure the nutritional status by anthropometric and biochemical parameters in HIV patients.
2. To identify risk factors due to alteration in nutritional status in people living with HIV.
3. To assess the nutritional status by biochemical investigations such as serum total protein, albumin, globulin.
4. To correlate the CD4 counts with anthropometric parameters and macronutrients.

4. Observations and Results

A total of 208 people living with HIV was enrolled in our study. There were 103 males and 105 females in our study. The age distribution of the participants varied from 21 years to 80 years. The majority of the subjects belonged to the age group of 36-45 years. The age and gender compositions are shown Figure. The anthropometry parameters have been tabulated in Table. The biochemical parameters were recorded and are shown in Table. The mean value of serum total protein was found to be 7.2 ± 1.0 g/dl and that of albumin was 3.35 ± 0.57 g/dl. The mean value of globulin was found to be 3.89 ± 1.04 g/dl. The Albumin-Globulin ratio turned out to be 1.03 ± 0.91 . The CD4 cell count on an average was 421.39 ± 230.07 cells/mm³. The anthropometry parameters were recorded for males and females separately as shown in Table. The mean weight in kilogram for females was 43.5 ± 9.69 and for males it was 43.6 ± 12.3 . The average BMI was found to be 20.10 ± 4.08 for males and 19.51 ± 3.53 for females. The mean hip circumference for males was 44.6 ± 30.78 and for females it was 35.15 ± 15.41 . The average waist circumference was 33.25 ± 15.52 in females and 39.37 ± 22.6 in males. The Waist-hip ratio was found to be 0.94 ± 0.198 and 0.95 ± 0.14 in males and females respectively. Most importantly about 83.65 percent (n=164) of the subjects were found to be in hypoalbuminemia and the rest 16.34 percent (n=34) were found to be with normal albumin levels.

5. Discussion

In our study 208 people living with HIV were included. On analyzing the anthropometry indices of the subjects, the BMI of females were better than males when observed. This shows that the females followed healthier nutritious

Table 1:

Anthropometry Parameters	Values (MEAN ± S.D)		P-value	Co-efficient of Karl Pearson's Correlation (R-Value)
	Female (n=105)	Male (n=103)		
Height (in cm)	148.4 ± 8.86	147 ± 18.75	0.00	0.32
Weight (in kg)	43.5 ± 9.69	43.6 ± 12.3	0.12	0.10
BMI (in kg/m ²)	19.51 ± 3.53	20.10 ± 4.08	0.25	0.08
Waist circumference (in cm)	33.25 ± 15.52	39.37 ± 22.6	0.25	0.08
HIP Circumference (in cm)	35.15 ± 15.41	44.6 ± 30.78	0.23	0.08
WAIST-HIP Ratio	0.95 ± 0.14	0.94 ± 0.198	0.96	0.003

Table 2:

Laboratory parameters	Values (MEAN ± S.D)		P-value	Co-efficient of Karl Pearson's Correlation (R-Value)
	Female (n=105)	Male (n=103)		
Total Protein (in g/dl)	6.65 ± 0.70	6.78 ± 1.47	0.56	0.04
Albumin (in g/dl)	3.2 ± 0.62	3.2 ± 0.66	0.00	0.27
Globulin (in g/dl)	3.36 ± 0.63	3.54 ± 1.63	0.00	0.19
Albumin- Globulin Ratio	1.03 ± 0.37	1.27 ± 1.72	0.03	0.15
CD4 Cell Count (in cell/ mm ³)	423.97 ± 222.36	426.17 ± 222.13	0.01	0.17

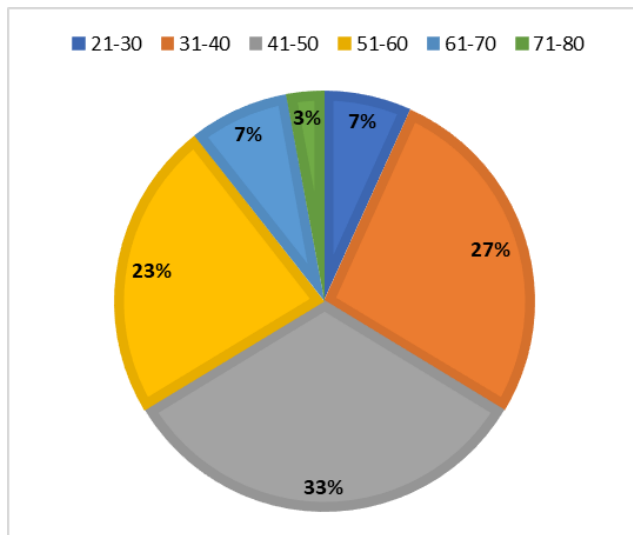


Fig. 2: Age distribution of the participants

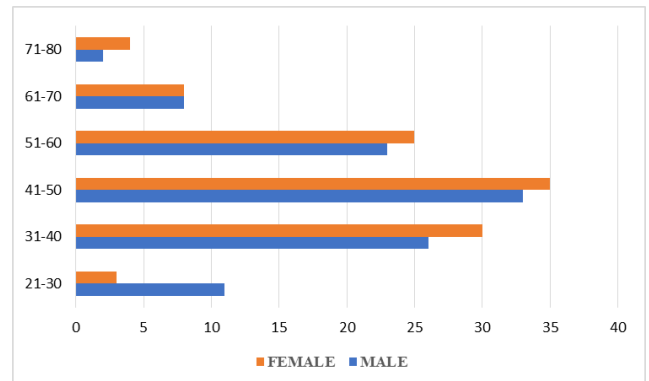


Fig. 3: Gender specific age distribution

diet than that of males. This is of concern, because weight loss and BMI have both been shown to be strong and independent predictors of survival in HIV-infected patients, especially when associated with lower CD4 cell counts. A study done by Mangili et al in 2006 suggests that muscle wasting is one of the most visible signs of malnutrition seen in patients who progress in HIV infection. But the waist circumference, hip circumference and mid-arm circumference are witnessed to be in normal limits. Muscle wasting was not seen in our study. This study coincides with the results of previous study done by Soumyanarayan

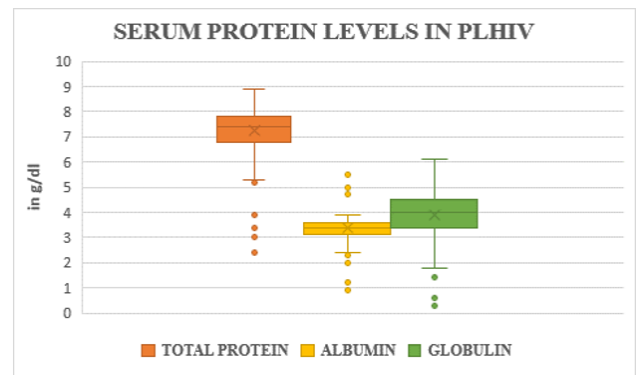


Fig. 4: Serum protein levels in PLHIV

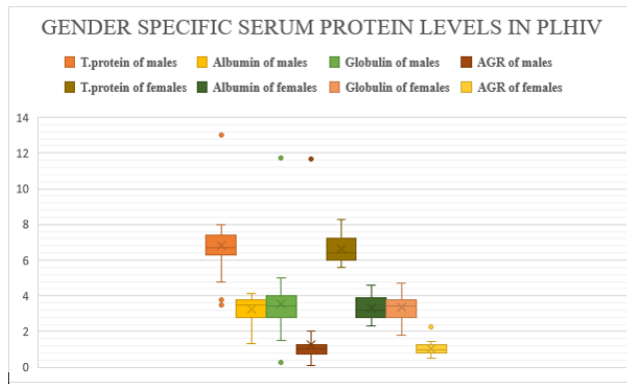


Fig. 5: Gender specific serum protein levels in PLHIV

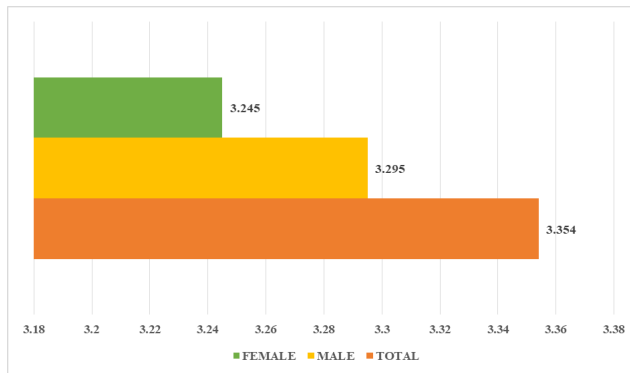


Fig. 6: Serum albumin levels in PLHIV

et al that the Body Mass Index of women very better than that of men, and hence the nutritional status of females was better than that of males. The biochemical parameters have to be taken into consideration in order to determine the status of malnutrition in people living with HIV. In a study done in south India by Sangeetha Kandasamy et al¹⁴ states that BMI has a strong inverse relationship with disease progression in people living with HIV. The study done by Soumya Swaminathan et al¹⁵ suggests that hypoalbuminemia is prevalent in people living with HIV; as it found that HIV-positive patients in southern India are anemic, more malnourished, and have hypoalbuminemia than they are socioeconomically matched HIV-negative individuals, despite similar caloric intake. In the present study the levels of protein in the subjects are found to be low with its mean value of 7.23 ± 1.00 g/dl. But the albumin values, although lies almost within the normal range is seen to be lower than the usual findings in people living with HIV with mean value 3.35 ± 0.79 . The reliable evidence of noticing hypoalbuminemia is the reversal of albumin globulin ratio. The albumin globulin ratio is seen in our study, with a value of 1.03 ± 0.91 . Although the clinical findings such as lowered waist hip ratio and presence of muscle wasting wasn't prevalent. The prevalence of hypoalbuminemia suggests the nutritional status is not

satisfactory in people living with HIV as albumin can be taken as a prognostic factor for HIV treatment. The CD4 cell count was found to be 421.39 ± 230.07 cells/mm³, is lesser than the normal range of 500 -1500 cells/mm³ this shows the infection is improving in a slower rate. As said in a study done by Chariot et al the CD4 count increases with the levels of albumin, in our study also the CD4 cell count has decreased and the prevalence of hypoalbuminemia is also observed.

6. Conclusion

To summarize, this study found that people living with HIV are more malnourished and suffer from hypoalbuminemia. Nutrition interventions should form an integral part of HIV care programs. Understanding the presence of opportunistic infections, decline in CD4 count, and advancing WHO clinical stages as risk factors can be helpful in preventing under nutrition from developing. Longitudinal research is necessary to further explicate associations between nutritional status and quality of life. This would delay the progression of disease and might improve the prospects of survival and quality of life of people living with HIV. Malnutrition has a negative impact in immunogenic recovery and increased risk of opportunistic infections. Malnutrition in people living with HIV might be fatal. In a resource poor setting with a high background level of malnutrition, HIV infection has an adverse effect on the nutritional status of the individual, which could be further worsened for other opportunistic infection. Both nutritional counseling and supplementation could help to maintain optimal nutritional status, especially among HIV-positive patients who are not yet receiving antiretroviral therapy. Therefore, malnutrition might be potential risk factor for increased mortality in patients initiating ART. Nutritional interventions may improve quality of life, life span and symptom management. Also, supports the effectiveness of medications and improves the patient's resistance to infections and other disease complications by altering immunity. So, supplementation of nutrients and preparing diet chart with frequent consultancies of dietician will improve quality of life in HIV patients. Prevention of nutritional deficiency decreases the mortality of the PLHIV.

7. Source of Funding

None.

8. Conflict of Interest

The authors declare no conflict of interest.


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Author biography

Harishh Ganesan, Student  <https://orcid.org/0000-0002-3969-9352>

Shivkumar Gopalakrishnan M D, Professor  <https://orcid.org/0000-0002-4933-1076>

K Velmurugan, Student  <https://orcid.org/0000-0003-1326-0015>

K Sangeetha M D, Professor  <https://orcid.org/0000-0001-8458-512X>

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