

Original research article

Study of Correlation between Serum Albumin with Disease Severity in HIV/AIDS Patients.

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Abstract

Background: Human immunodeficiency virus (HIV) a lentivirus that acquired immunodeficiency syndrome (AIDS) in which there is progressive failure of the immune system with life threatening opportunistic infections and cancers. So there is a need to identify and establish relationship between serum albumin level with disease severity in HIV/AIDS patients.

Methods: This is cross sectional study was conducted on 81 HIV/AIDS patients presenting to and registered ART center at Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar, during the period from September 2020 to June 2021. A detailed history, clinical examination and laboratory investigations was done.

Results: Our study the mean serum albumin level was 3.11 ± 0.50 . There was a significant correlation between serum albumin level with CD4 + counts was 0.627.

Conclusion: Study indicating that albumin could be used as a supplementary marker for immunosuppression in HIV/AIDS patients.

Keywords: HIV/AIDS, Serum albumin, CD4 + cells, Supplementary marker.

Introduction

AIDS is one of the most devastating infectious disease in human history and its causative agent HIV. [1,2] Human immunodeficiency virus (HIV) a lentivirus that acquired immunodeficiency syndrome (AIDS) in which there is progressive failure of the immune system with life threatening opportunistic infections and cancers. HIV infection in human is considered pandemic by the World Health Organisation's (WHO). HIV infects about 0.6% of the worlds population. In 2001, AIDs claimed an estimated 1.8 million lives, down from a global peak of 2.1 million in 2004. Intensified awareness and preventive measures, as well as the natural course of the epidemic have played a role. Nevertheless an estimated 2.6 million people were newly infected in 2009.[3,4,5]

Human immunodeficiency virus (HIV) a lentivirus that acquired immunodeficiency syndrome (AIDS) in which there is progressive failure of the immune system with life threatening opportunistic infections and cancers. HIV infects the vital cells of the immune system such as helper T cells (CD4 + T cells), macrophages and dendritic cells.

HIV leads to low levels of CD4 + T cells by three main mechanisms:

1) directly killing of virus with infected cells

- 2) Increased rate of apoptosis in infected cells and
- 3) Killing of infected CD4 + T cells by CD 8 cytotoxic lymphocytes that recognise infected cells.

When CD4 + T cells decline below a critical level cell mediated immunity will be lost and hence the body progressively become more susceptible to all the opportunistic infections. CD4+ cell count and HIV RNA values is the widely accepted investigation as the most powerful prognostic indicators of HIV disease progression. Use of the above markers, is in developed countries, but in developing countries they are still not regularly obtained due to cost and infrastructure constraints. While they are the important clinical markers, they will not fully explain an individual's prognosis.

The rationale of the study is, there is a need to find efficacy of alternate prognostic markers of immunosuppression. Also serum albumin level would prove to be a very useful, cheap surrogate test for predicting the severity of HIV infection.

Objective:

To study serum albumin level and to correlate the levels of serum albumin with CD4 count in HIV / AIDS patients.

Material and Methodology:

A single center based cross sectional study of HIV positive patients of Anti-Retroviral Therapy in Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar will be taken during the study period from September 2020 to June 2021. The subject was included in the study were patients who were already on the regimen of Anti-Retroviral Therapy from ART center and were willing to participate. Under all aseptic precaution 2ml of venous blood was collected for measurement of serum albumin level. A detailed history was recorded, clinical examination and laboratory investigations including hemoglobin, total and differential WBC counts, Hematocrit, Liver function tests with serum albumin level, renal function tests, urine routine microscopy, CD4 + cells counts were done. The subjects were excluded in the study those who were any preexisting hepatobiliary, renal disease or kidney disease, gastrointestinal disease causing decrease in albumin level.

Sample size:

In this study total 81 sample were participating and sample size was calculating by using R statistical software & considering baseline serum albumin level was 2.87 (CD4 < 200) & 3.17 (CD4 > 200) with the variation of 0.61, 95% confidence interval, 80% power of size. [6]

Statistical Analysis:

Categorical data were presented as a frequency or percentage. Quantitative data were presented as a Mean \pm Standard deviation if data follow normality condition otherwise were presented as Median or Inter quartile range (IQR). P value less than 0.05 were considered as a statistically significant.

Analysis:

In the present study, the correlation between serum albumin with CD4 + cell count was studied in 81 HIV/AIDs patients were recruited.

Table 1: Distribution of Demographic Variables

Parameters		No. of patients	Percentage
Gender	Male	44	54.3%
	Female	37	45.7%
Age group	Less than 30 Yrs	3	3.7%
	31 – 40 Yrs	26	32.1%
	41 – 50 Yrs	29	35.8%
	51 – 60 Yrs	18	22.2%
	More than 60 Yrs	5	6.2%
Socio Economic class	Lower	1	1.2%
	Lower Middle	16	19.7%
	Middle	16	19.7%
	Upper Middle	45	55.6%
	Upper	3	3.7%
Complaints	Cough	20	24.7%
	Fever	27	33.3%
	Diarrhea	11	13.6%
	Weight loss	5	6.2%
	Seizure	7	8.6%
	Arthritis	2	2.5%
	Breathlessness	4	4.9%
	Neck Swelling	5	6.2%

Table 2: Mean distribution of Laboratory parameters

Laboratory Parameters	Mean \pm S. D.
Hemoglobin	11.29 \pm 2.01
Total Count	7207 \pm 1986
CD4 + Count	378.4 \pm 23.7
Serum Albumin	3.32 \pm 0.6

Table 3: Correlation of Serum Albumin between CD4 + count:

CD4 + Count	Albumin Level	P value
< 200 (n = 26)	2.84 \pm 0.78	0.020 (S)
> 200 (n = 55)	3.24 \pm 0.67	
Correlation (r)	0.627	0.009 (S)

Results & Discussion:

With the aim and objective to correlate the serum albumin level with the disease severity of HIV/AIDS patients.

This study was conducted on 81 patients during the January 2021 to December 2021 at the department of general medicine in Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar. While Sundeep K & friends (6) conducted a study on a total of 100 who were HIV positive. In the study of Singh al (7) 60 HIV patients and 60 control patients were included. Hilalpur al (8) conducted a study on a total of 200 HIV / AIDS patients were participated.

In this study out of total 81 participants most were 31 – 50 years 55 (67.9%) of age group and only 3 (3.7%) were below 30 years of age. In the study of Sundeep K (6) 64% of the patients were belonging to the 31 – 50 years of age group. Similarly, Singh al (7) 55% participants were 31 – 50 years of age. Also in the study of Sharma SS (9) was found 58% study sample were belonging to the 31 – 50 years age group.

In this study out of total 81 participants most were male 44(54.3%) and females were only 37 (45.7%). This study male female ratio was 1.2: 1. Similarly, Sundeep K (6) majority 54% were male & the ratio was pretty close but in the study Hilalpure al (8) the ratio was 2.77: 1 (147 male & 53 female) and in the study of Sharma SS al (9) the males were in majority 72%.

The most common presenting complaints was fever seen in 27 (33.3%) cases followed by cough and diarrhea in 20 (24.7%) and 11 (13.6%) respectively. Similar, Sundeep K (6) fever was found 35% followed by cough (19%). In the study Singh al (7), most common presenting complaints of patients was fever (30%) followed by cough (18.3%) 7 diarrheas were third most common features at 10%.

In our study the mean serum albumin level was 3.11 ± 0.50 . Also the serum albumin level was 2.84 ± 0.78 in less than 200 CD4 + cell count and More than 200 CD4 + cell count of serum albumin level was 3.24 ± 0.67 . The values of albumin and CD4 counts were found to have a strong positive correlation amongst them with correlation coefficient of 0.627 with statistically significant p values of 0.009.

Conclusion:

The male female ratio was 1.2: 1. There was a strong and significant correlation between CD4 + cell count with serum albumin level in the study subjects indicating that albumin could be used as a supplementary marker for immunosuppression in HIV/AIDS patients.

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Conflict of Interest: None

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Ethical Clearance: Approved by Institutional Ethical Committee, CAIMS Karimnagar

Reference:

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