



PREVALENCE OF MICROALBUMINURIA AND PROTEINURIA IN ART NAIVE HIV PATIENTS AND CORRELATION WITH CD4 COUNTS

Internal Medicine

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KEYWORDS

BACKGROUND:

There is significant increase in longevity of HIV patients in recent times¹. However there is also increase in deaths among HIV infected patients attributed to liver and kidney disease². The presence of proteinuria Among HIV infected persons, has been linked to CKD (chronic kidney disease), ESRD (end stage renal disease), new AIDS defining illness and mortality^{3,4}. Renal involvement in HIV positive patients ranges from mild fluid and electrolyte disorders to acute renal failure and HIV associated nephropathy (HIVAN), which ultimately leads to end-stage renal disease (ESRD)⁵.

Microalbuminuria is the earliest indicator of impending nephropathy, it is the excretion of >30 mg and <300 mg of albumin in the urine/day or 20-200 g/minute on first morning spot urine sample not detectable by standard dipstick test for albumin. It is recommended by the American Diabetes Association and the National Kidney Foundation that the for diagnosis of microalbuminuria the measurement of albumin to creatinine ratio (ACR) in a random spot urine collection has to be done⁶. Overall microalbuminuria is seen in ~20% (varying from 9% to 30% in various studies) of untreated HIV infected patients⁷. Microalbuminuria levels showed correlation with CD4 T cell count suggesting an association between the progression of disease and microalbuminuria⁸.

CKD is defined by a sustained change in urinary sediment, such as the presence of proteinuria, or by a reduced glomerular filtration rate (GFR). Proteinuria is often the earliest manifestation of CKD and is more common in HIV-infected individuals than in similarly aged HIV-negative controls. Risk factors for incident or progressive CKD in HIV-positive adults include apolipoprotein-1 genetic polymorphism, hepatitis C virus (HCV) coinfection, a low CD4 T-cell count, a high HIV viral load and traditional CKD risk factors such as diabetes and hypertension⁹.

As far as the renal spectrum in HIV is concerned there are very few Indian studies, The present study covering this aspect of the HIV spectrum will throw more light on the spectrum of renal involvement in HIV infected individuals.

OBJECTIVES:

1. To estimate the prevalence of micro albuminuria in HIV patients,
2. To correlate prevalence of microalbuminuria with CD4 cell count.

METHODS:

A cross sectional clinical study conducted at MRMC Kalaburgi during the period of August 2022 - January 2024 on 70 patients admitted to outpatients and inpatient department of General medicine with various prodromal symptoms and infections.

RESULTS:

Observations

Table No.1: Age And Gender Wise Distribution Of HIV Infected Patients

Age in years	Males		Females		Total	
	No.	%	No.	%	No.	%
≤ 30	6	17.6	9	25.0	15	21.4
31—40	9	26.5	6	16.7	15	21.4
41—50	11	32.4	13	36.1	24	34.3
51—60	8	23.5	8	22.2	16	22.9
Total	34	100.0	36	100.0	70	100.0
Mean ± SD	41.00 ± 10.43		41.70 ± 12.38		41.37 ± 11.34	
P-value	t = 0.255 P = 0.799, NS					

NS= not significant, S=significant, HS=highly significant

Study observes that, maximum number of patients 24 (34.3%) were belongs to the age group of 41-50 years, followed by 316 (22.9%) of patients were belongs to the age group of 51—60 year and each 15 (21.4%) of patients were belongs to the age group of 31--40 years and ≤ 30 years. Minimum age of patient was 18 years and maximum age of patient was 60 years. The mean age of male patients was 41.0 years and the mean age of female patients was 41.70 years. There was statistically no significant difference of age among gender (P>0.05)

Multiple Bar Diagram Represents Age And Gender Wise Distribution Of Patients

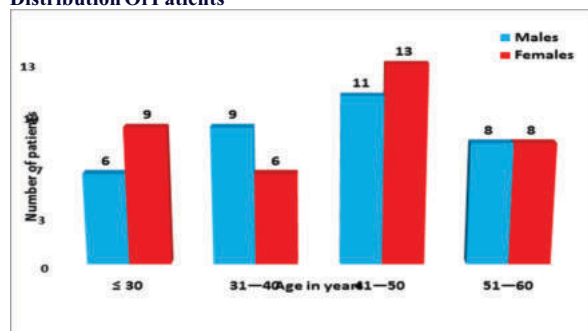


Table No.2: Gender Wise Distribution Of Patients

Gender	Number of patients	Percentage
Males	34	48.6
Females	36	51.4
Total	70	100.0

Study observed that; 36 (51.4%) of patients were males and 34 (48.6%) of patients were females. Sex ratio of male to female was 1:1.06

Pie Diagram Represents Gender Wise Distribution Of Patients

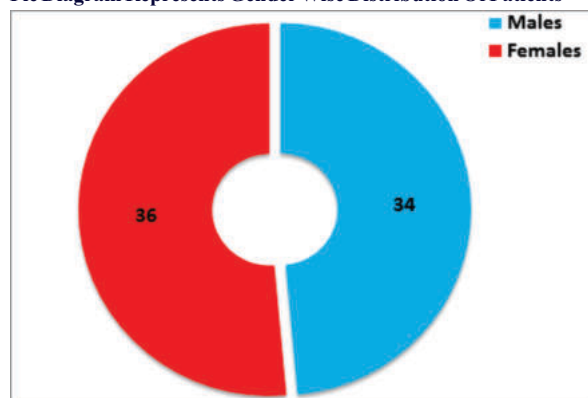


Table No.3: CD4 Counts Wise Distribution Of HIV Infected Patients

Cd4 count	Number of patients	Percentage
≤ 350/ μL	41	58.6
>350/ μL	29	41.4
Total	70	100.0
Mean ± SD	352.02 ± 115.06	

Study observed that; 41 (58.6%) of patient's CD4 count was ≤ 350/ μL and 29 (41.4%) of patient's CD4 count was > 350/ μL. The mean CD4 count was 352.02

Bar Diagram Represent CD4 Counts Wise Distribution Of HIV Infected Patients

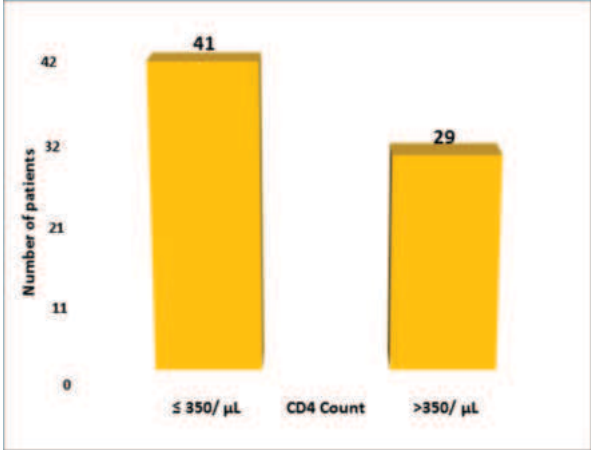


Table No.4: Mean And SD Of Investigations

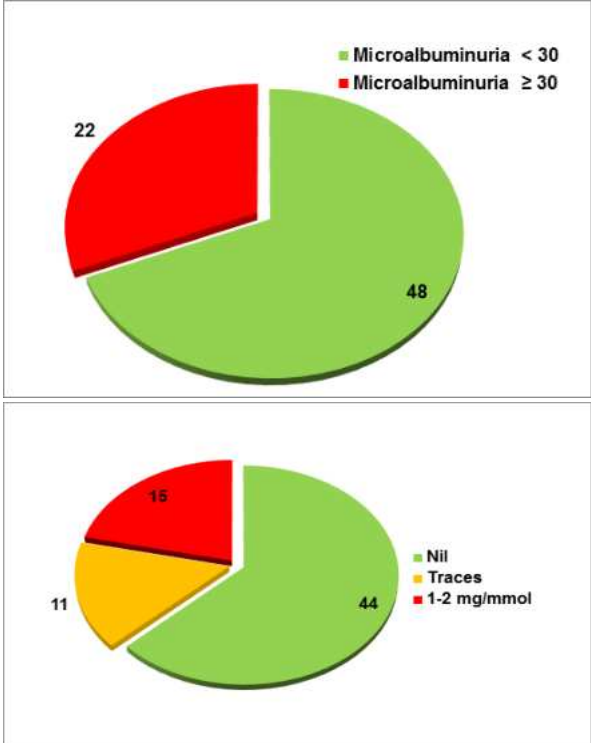
Parameters	Minimum	Maximum	Mean	SD
HB	6.0	18.0	10.64	2.03
TC	1200	24000	7810.14	3734.04
ESR	4	100	35.51	25.13
Urea	6	71	21.11	9.84
Creatinine	0.40	1.70	0.84	0.27
TB	0.20	3.00	0.91	0.38
Na	129.0	150.0	138.75	4.40
K	2.80	5.20	4.06	0.54

Table No.5: Microalbuminuria Wise Distribution Of HIV Infected Patients

Microalbuminuria	Number of patients	Percentage
< 30	48	68.6
≥ 30	22	31.4
Total	70	100.0
Mean ± SD	42.17 ± 47.12	

Study observed that; the minimum microalbuminuria was 5 and maximum was 185, the mean microalbuminuria was 41.17. The prevalence of microalbuminuria was 31.4%

Microalbuminuria Wise Distribution Of HIV Infected Patients



Pie Chart Shows Proteinuria Wise Distribution Of HIV Infected Patients

Table No.6: Proteinuria Wise Distribution Of HIV Infected Patients

Proteinuria	Number of patients	Percentage
Nil	44	62.8
Traces	11	15.7
1-2 mg/mmol	15	21.5
Total	70	100.0

Study observed that; out of 70 sample HIV infected patients; in 44 (62.8%) of patients shows the proteinuria nil, in 11 (15.7%) of patients traces the proteinuria and 15 (21.5%) of patients had seen the proteinuria in the range of 1—2 mg/mmol

Table No.7: Distribution Of HIV Infected Patients According To Associate Diseases

Associate diseases	Number of patients	Percentage
PTB	17	24.3
Oral thrush	7	10.0
Oesophageal candida	4	5.7
Hsv infection	2	2.9
Disseminated varicella	1	1.4
Lymphadenopathy	1	1.4
Pneumocystis carnie	1	1.4
VDRL reactive	1	1.4

In the present study; common associated disease was seen in 17 (24.3%) of patients, followed by 7 (10.0%) patients associate disease was Oral thrush, 4 (5.7%) of patients associate disease was Oesophageal candida.

Bar Diagram Represents Associate Diseases Wise Distribution Of Patients

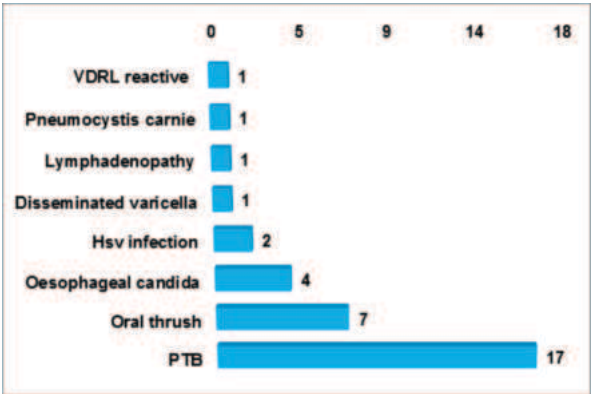
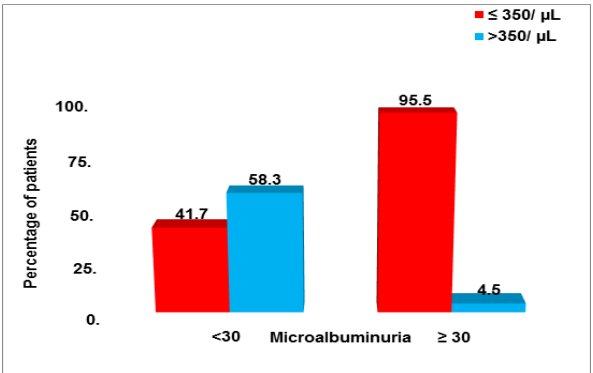


Table No.8: Correlation Between CD4 Count And Microalbuminuria

Cd4 count	Microalbuminuria				Total	
	<30		≥ 30			
	No.	%	No.	%	No.	%
≤ 350/μL	20	41.7	21	95.5	41	58.6
>350/μL	28	58.3	1	4.5	29	41.4
Total	48	100.0	22	100.0	70	100.0
X ² test, P-value	X ² = 17.986, P = 0.0001, HS					
Correlation coefficient	r = -0.554, P < 0.001, HS					

NS= not significant, S=significant, HS=highly significant



Bar Diagram Presents Correlation Between CD4 Count And Microalbuminuria

Study reveals that; statistically highly significant association of lower the CD4 count with higher the microalbuminuria (P<0.001)

There was statistically highly significant negative correlation between CD4 count and Microalbuminuria (P<0.001)

Table No.9: Comparison Of Levels Of CD4 Counts With Lab Investigations

Variables	Cd4 counts		t-test value, P-value & significance
	≤ 350/ μL (N=41)	>350/ μL (N=29)	
HB	10.45 ± 2.34	10.93 ± 1.51	t = -0.958, P = 0.342, NS
TC	7957.75 ± 4307.1	7555.17 ± 2888.3	t = 0.437, P = 0.664, NS
ESR	38.6 ± 26.43	31.44 ± 23.49	t = 1.161, P = 0.250, NS
Urea	26.67 ± 10.29	21.10± 8.45	t = -2.362, P = 0.361, NS
Creatinine	1.09 ± 0.30	0.93 ± 0.29	t = -2.025, P = 0.021, S
TB	0.95 ± 0.29	0.86 ± 0.49	t = 0.963, P = 0.045, S
Na	138.95 ± 4.40	138.48 ± 4.54	t = 0.429, P = 0.669, NS
K	3.94 ± 0.55	4.19 ± 0.49	t = -1.902, P = 0.058, NS
Microalbunuria	60.17 ± 52.42	14.48 ± 14.90	t = 4.554, P = 0.000, HS

Study reveals that; there was statistically no significant difference of mean HB, TC, ESR, Urea, Creatinine, TB, sodium and potassium between higher and lower levels of CD4 counts (P>0.05).

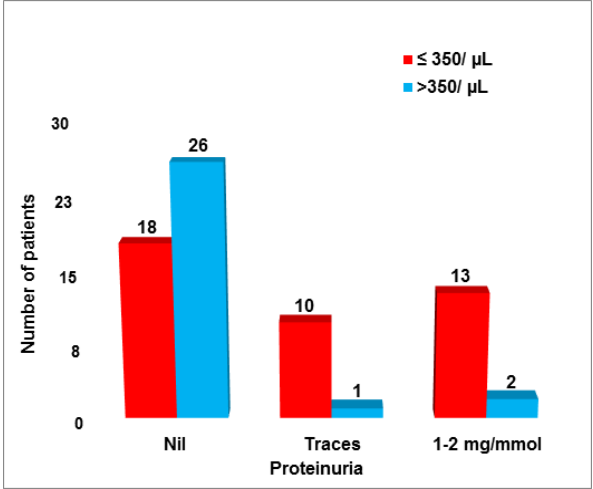
Whereas there was statistically highly significant difference of mean **microalbuminuria** between higher and lower levels of CD4 counts (P<0.001) and also statistically significant difference of mean of **Urea** and **Creatinine** between higher and lower levels of CD4 counts (P<0.05)

Table No.10: Comparison Of Presence Of Proteinuria With Levels Of CD4 Counts

Proteinuria	No. of patients	Cd4 counts			
		≤ 350/ μL		>350/ μL	
		No.	%	No.	%
Nil	44	18	43.9	26	89.6
Traces	11	10	24.4	1	3.5
1-2 mg/mmol	15	13	31.7	2	6.9
Total	70	41	100.0	29	100.0
X ² test, P-value	X ² = 15.276, P = 0.0005, HS				

Study reveals that; there was statistically highly significant difference of proteinuria between higher and lower levels of CD4 counts (P<0.001)

Bar Diagram Presents Comparison Of Proteinuria With CD4 Counts



CONCLUSION:

Microalbuminuria is a marker of renal damage that is associated with increased risk of cardiovascular disease and mortality in the general population.

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