

Correlation of Renal Function with CD4 count among Antiretroviral Therapy-Naive, HIV-Infected Patients in JLN Medical College and associated hospitals, Ajmer

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Abstract

Introduction: Renal involvement in HIV patients is relatively common. Long-term infection with HIV is associated with numerous renal complications. It can cause HIV associated nephropathy, opportunistic infections associated nephropathy, immune complex mediated glomerulonephritis, thrombotic microangiopathy, interstitial nephritis and various electrolyte disturbances among others.

Objectives: The study was carried out to determine the prevalence of abnormal renal function among ART-naive, HIV-infected patients in JLN Medical College and associated hospitals, Ajmer

Material and Methods: Total 204 first time HIV positive patients with no previously documented risk factors for renal insufficiency were studied over a 1-year period from June 2018 to May 2019. All these

patients tested for CD4 count, blood urea and serum creatinine.

Results: Maximum cases were from age group 21-40 yrs(57.84%), males preponderance over females, housewives mostly affected followed by labourers with low education level. Significant correlation was observed in CD4 and age $r = -.190^{**}$, $P < 0.007$ S, but negative poor correlation was observed CD4 with serum creatinine $r = -.033$ P value 0.643NS and serum urea $r = -.054$ P value 0.443NS.

Conclusion: We assessed males preponderance over females this differences may be due to male dominance, low education and socioeconomic condition of females. As a correlation among age with CD4 count and serum creatinine was observed, so serum creatinine should be mandatory in all HIV positive patients and also awareness should be

increased among the females and the society about HIV and HIV associated renal diseases .

Keywords: Renal , HIV, ART-Naive, CD4

Introduction

Human immunodeficiency Virus (HIV) is a leading cause of morbidity and mortality worldwide , especially in sub-Saharan Africa¹. Long-term infection with HIV is associated with numerous renal complications. It can cause HIV associated nephropathy, opportunistic infections associated nephropathy, immune complex mediated glomerulonephritis, thrombotic microangiopathy, interstitial nephritis and various electrolyte disturbances among others.²⁻⁷ Globally, the prevalence of renal disease among the HIV infected adult population has been estimated to range between 5% and 30%. Screening for renal disease is recommended for all HIV-infected individuals at diagnosis of the infection and at initiation of antiretroviral therapy (ART). Renal insufficiency has been shown to be a insignificant risk factor for mortality among HIV-infected patients⁸. HIV associated renal disease has a high burden of mortality and morbidity , it leads to rapid progression till end-stage renal disease (ESRD) in the absence of highly active antiretroviral therapy (HAART), few studies to date have tried to determine the true prevalence of abnormal renal function among (ART)-naive patients⁹. This study therefore aims to determine the prevalence of abnormal renal function among ART-naive, HIV-infected patients in JLN Medical College and associated hospitals, Ajmer.

Methods

It was a retrospective observational study. Patients with confirmed HIV infection, with no previously documented risk factors for renal insufficiency, were consecutively recruited and studied over a 1-year period from June 2018 to May 2019. Study participants included patients presenting for the first time at the ICTC, Department of Microbiology, JLN Medical college , Ajmer and found HIV positive as per NACO guideline. All the first time HIV positive patients tested for CD4 count (BD test kit; BD FACS Count SYSTEM), blood urea and serum creatinine (Backman coulter AU680 & Randox RX Imola Chemistry Analyzer).

Exclusion criteria

- Age < 18 months
- Patients with conditions known to be associated with kidney abnormalities, sickle cell disease, acute infection, pregnancy, previously diagnosed diabetes, systemic hypertension, or previously known renal disease were excluded.

Results

A total of 204 HIV positive (naive ART) patients were included in the study. Maximum cases were from age group 21-40 yrs (57.84%), males preponderance over females, housewives mostly affected followed by labourers with low education level (primary & literate)

Table 1

		Count of S.No.	
		Number	Percentage%
Age Group	1 To 10	5	2.45
	11 To 20	21	10.29
	21 To 30	56	27.45
	31 To 40	62	30.39
	41 To 50	37	18.14
	51 To 60	17	8.33
	64 To 70	6	2.94
	Total	204	100.00
Sex	F	81	39.71
	M	123	60.29
Occupation	Agriculture	11	5.39
	Business	33	16.18
	House Wife	63	30.88
	Service	17	8.33
	Student	14	6.86
	Truck Driver	10	4.90
	Unemployed	11	5.39
	Labourers	45	22.06
Education	Non-Literate	1	0.49
	Primary	109	53.43
	Secondary	18	8.82
	Graduate	11	5.39
	Literate	65	31.86

Table 2

The mean +SD of age , serum creatinine , serum urea , CD4,are 34.84 ± 13.57 years , 0.82 ± 0.26 mg/dl , 22.10

± 12.95 mg/dl, 341.72 ± 261.06 cells/mm³ respectively.

	Minimum	Maximum	Mean	Std. Deviation
Age	4	70	34.84	13.57
serum creatinine	0.5	2.0	0.82	0.26
serum urea	10.8	162.0	22.10	12.95
cd4	14	1533	341.72	261.06

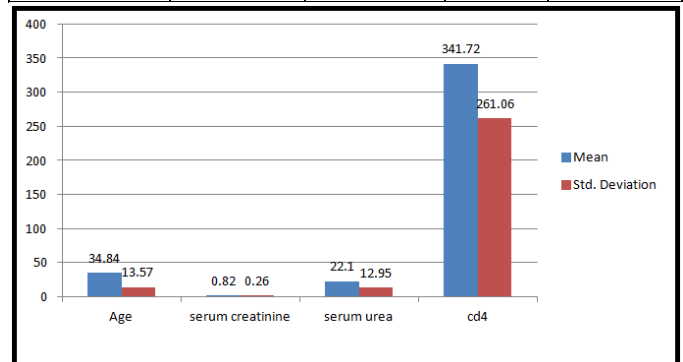


Table 3

Correlations				
		Age	serum creatinine	serum urea
cd4	Pearson Correlation	-.190**	-.033	-.054
	Sig. (2-tailed)	.007	.643	.443
	N	201	204	204

** . Correlation is significant at the 0.01 level (2-tailed).

Significant correlation was observed CD4 and age r = -.190**, 0.007 S, but negative poor correlation was observed CD4 with **serum creatinine** r = -.033 P value 0.643NS and **serum urea** r = -.054 P value 0.443NS.

Discussion

HIV continues to be a major global public health issue, Globally approximately 37.9 million people living with HIV at the end of 2018.India has the third largest HIV epidemic in the world with 2.1 million people living

with HIV. HIV prevalence among adults aged 15-49 was an estimated 0.2%. This figure is small compared to most other middle-income countries.⁽¹⁴⁾ As the prevalence of HIV is increasing, the spectrum of renal disorders in HIV patients is also changing. HIV-related renal diseases include various histological spectrum that consists of HIV associated nephropathy(HIVAN), thrombotic microangiopathy, ART-related nephropathies, and comorbidities-associated nephropathies in HIV patients. HIVAN was first reported in the United States in 1984⁽¹²⁾. The present study aim to find out correlation between renal dysfunction among HIV positive naive ART patients . Human immunodeficiency virus-associated renal disease can present at any stage of HIV illness.

A total of 204 HIV positive (naive ART) patients were included in the study. The mean age in our study was 34.84 ± 13.57 years with a male predominance 60.29% over female 39.70% and maximum in middle 21-40 age groups 57.84% followed by 12.74% were 0-20 age groups. Bhupendra Verma et al⁽¹⁰⁾ recorded 67% from age group 20-40 years with male preponderance over females which is quite similar with our study . As per the other studies like Fausta Moshaget al⁽¹³⁾ females(70%) are more infected with HIV than males but in present study its opposite, this difference may be due to male dominance , low education and awareness , low socioeconomic condition of females in this area , so males are predominance . Elevated serum creatinine, serum urea , or both also were associated with nearly a threefold excess risk of subsequent mortality in HIV-infected patients . Elevated serum creatinine are useful marker of subsequent mortality in HIV-positive patients as a marker of subsequent mortality. The strong association with mortality of HIV positive renal abnormalities suggests that even a single instance of

elevated creatinine may be of great significance in HIV-positive patients. One possible reason that a single elevation is of such importance in this population is that renal disease may be more aggressive in HIV-positive patients and more easily identified with measures that would be considered to nonspecific in other populations.

Serum creatinine detected above the normal range in (5.39%)in present study. Lytt I. Gardne et al⁽¹¹⁾ recorded (7.2%) HIV-positive with elevated serum creatinine that is quite similar with our study . Bhupendra Verma et al⁽¹⁰⁾ observed serum creatinine > 1.5 mg/dL (above the normal range) in 15.8% patients which is higher than present study .This is may due to selection of HIV positive patient with CKD. In present study CD4 counts have negative poor correlation with serum creatinine $r = -.033$ P value 0.643NS. Bhupendra Verma et al⁽¹⁰⁾ observed CD4 counts were significantly correlated with serum creatinine $r = -0.26, P = 0.02$.

The mean CD4 count was 341 ± 261 cell/mm³ of HIV Positive with renal impairment patients in present study . Bhupendra Verma et al⁽¹⁰⁾ also recorded the mean CD4 count was 314 ± 175 cell/mm³ , which is quite similar with present study. Human immunodeficiency virus-related renal dysfunction is an important entity. We assessed the gender differences on HIV disease progression. This difference may be due to male dominance, low education level, low socioeconomic condition of females in this area. Female HIV patients delay seeking diagnosis and enter into treatment at a significantly more advanced stage of HIV infection, which predisposes them to increased mortality and worse treatment outcome. We saw a significant correlation among age with CD4 count and serum creatinine. So serum creatinine should be

mandatory in all HIV positive patients and also awareness should be increased among the females and the society about HIV and HIV associated renal diseases .

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