Original Research Article

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Prospective study of renal abnormalities in HIV seropositive patients

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ABSTRACT

Background: Human Immunodeficiency Virus (HIV) infection may lead to renal impairment, however Indian data is limited. The objective of this study was to study clinical, biochemical and radiological spectrum of renal dysfunctions in HIV patients.

Methods: Hundred HIV positive patients were studied in Department of Medicine, G.R. Medical College, Gwalior. Detailed history, clinical examination, laboratory investigation (hemoglobin, random blood sugar, CD4 counts, urine analysis (proteinuria, sugar, pus cells, red blood cells), blood urea estimation, serum creatinine and ultrasound of kidneys were done for all the patients.

Results: Mean age of the study cohort was 43.09 ± 10.57 years with male predominance. Maximum patients belong to age group of 41-50 years (35%). Majority patients were from urban area (61%), married (86%), belong to low socioeconomic status (91%) and about one third were truck drivers (36%) by profession. Mean CD4 count was 236.14 ± 134.006 whereas, maximum patients had CD4 count of <200 (52%). Most common clinical and radiological finding was edema (18.02% male and 29.41% female) and raised renal echotexture (15.66% male and 5.88% female) respectively. Mean hemoglobin, blood urea, serum creatinine and albumin among male and female were 11.36 ± 11.58 , and 9.65 ± 1.90 , 53.78 ± 53.99 and 55.03 ± 47.10 , 1.33 ± 1.03 and 1.24 ± 0.90 , 3.22 ± 0.76 and 3.12 ± 0.69 respectively.

Conclusions: Proteinuria, elevated serum creatinine, edema and raised renal echo texture are the early markers of nephropathy in HIV positive patients.

Keywords: Edema, HIV, Nephropathy, Radiological findings, Serum creatinine

INTRODUCTION

Human immunodeficiency virus (HIV) infection has been associated with many renal manifestations and these disorders are encountered at all the stages of HIV infection. HIV associated renal impairment can be acute or chronic; it can be due to direct or indirect effects of HIV or drug related effects that are directly nephrotoxic or can induce metabolic vasculopathy and renal damage. 1,2

The most common cause of renal failure in HIV patients is the syndrome of HIV-associated nephropathy.^{3,4} Reports from Miami and New York workers depicted a

characteristic renal lesion named HIV-associated nephropathy (HIVAN). Histological feature of HIVAN was segmental glomerulosclerosis which was associated with nephrotic range proteinuria and rapidly progressive renal failure. ^{5,6} Hence, present study was done to study various factors associated with the renal impairment in HIV positive patients.

METHODS

This prospective study was conducted on 100 HIV positive patients including outdoor as well as indoor patients the in Department of Medicine, G.R. Medical College, Gwalior.

Institutional Ethics Committee approval and a written informed consent were obtained before starting study. After taking detailed history, clinical examination and relevant investigation including hemoglobin and random blood sugar (RBS), CD4 counts estimation were done for all patients and the results were recorded in pre-approved excel format.

Other investigation including urine sample for the presence of proteinuria, sugar, pus cells, red blood cells, blood urea estimation, serum creatinine and ultrasound of kidney was also performed.

All seropositive patients for HIV infection having age between 18 to 75 years were included in the present study. Patients not giving written consent and with previous history of hypertensive nephropathy and diabetic nephropathy were excluded.

All the data analysis was performed using IBM SPSS Version 20. Percentage was calculated for quantitative data. Data was expressed as Mean±Standard deviation (SD).

RESULTS

Mean age of the study population was 43.09 ± 10.57 years which range from 19 to 65 years. Most of the patients were from the age group of 41-50 years (35%) followed by 27% patients who belong to age group of 31-40 years. Maximum patients were male (83%) compared to female (17%). Most of the patients were from urban area (61%), were married (86%), belong to low socioeconomic status (91%), about one third were truck drivers (36%) and 23% were farmers. Mean CD4 count of study cohort was 236.14±134.006. Maximum patients (52%) had CD4 count of <200.

Table 1: Showing clinical, biochemical and radiological investigation of study cohort.

Findings		Male (n=83)	Female (n=17)
Clinical	Puffiness of face	3 (3.61)	0 (0)
	Swelling of legs	9 (10.84)	1 (5.88)
	Oliguria	13 (15.66)	4 (23.52)
	Breathlessness	5 (6.02)	2 (11.76)
	Oedema	15 (18.02)	5 (29.41)
Biochemical*	Hb	11.36±11.58	9.65±1.90
	Blood urea	53.78±53.99	55.03±47.10
	Serum creatinine	1.33±1.03	1.24±0.90
	Serum Albumin	3.22±0.76	3.12±0.69
USG (kidney)	Enlarge kidney	0 (0)	0 (0)
	U/L contracted kidney	0 (0)	0 (0)
	B/L contracted kidney	0 (0)	0 (0)
	Raised renal echotexture	13 (15.66)	1 (5.88)

Data is expressed as no of patients (percentage), *data is expressed as mean±SD, USG; ultrasonography, Hb; hemoglobin, U/L-Unilateral, B/L - Bilateral

Most of the patients with CD4 count <250 were males [52 (3.25 ± 0.12)] followed by females [5 (3.14 ± 0.02)]. Twenty-two (3.02 ± 0.22) male patients had CD4 count between 250-500 whereas only 1 (3.8) female had CD4 count between 250-500. None of the female had CD4 count >500 whereas 5 (3.16 ± 0.21) males had CD4 count >500.

DISCUSSION

HIVAN is the most common renal manifestation in HIV patients, which was first described in 1984. 7 In patients with nephrotic syndrome, there is a progressive loss of renal function which in absence of adequate treatment can progress to ESRD within months.⁸ The age distribution of HIVAN cohort as reported by other authors was 20-64 years.^{3,9} Similar age range is noted in the current study which suggests that HIVAN is more

common in people in their reproductive and sexually-active years.

A Nigerian study by Garko et al on 100 HIVAN patients reported high serum creatinine level, increased degree of proteinuria and lower CD4 counts which is in accordance to the present study findings.³ Study on abdominal ultrasound on 146 AIDS patients by N'zi et al detected hyperechoic kidneys suggestive of HIVAN in 13.7% in their study.¹⁰ Similar to those Obajimi et al studied 391 HIV positive patients and demonstrated increased renal cortical/medullary echotexture in 8.4% patients.¹¹ Findings of renal echogenicity in present study is confirming the results demonstrated by N'zi et al and Obajimi et al.

A North Indian study by Gupta et al, including 526 patients reported that only 17.3% had renal involvement

out of which 14% had proteinuria. A low occurrence of renal involvement found in these patients may be due to the renoprotective effect of ART.¹² Longo et al, found prevalence of proteinuria as 20.5%, but Kaloustian et al found much lower prevalence of 6.2%.^{13,14}

Most common feature reported by Gupta et al was fever (35%) and edema (27%) which is in accordance to the findings of present study where edema followed by oliguria was the most frequent presenting feature. ¹² Most of the patients revealed low CD4 count (52%) in present study which is in agreement with the Odongo et al where low CD4 count was observed in 32% patients. ¹⁵

Crum-Cianflone et al, evaluated 717 HIV positive patients and reported that factors associated with impaired kidney in HIV patients were older age, low CD4 count and low socio-economic status which is in agreement with the present study findings.¹⁶

Limitation of this study was apart from small sample size, we did not measure microalbuminuria which is considered as one of the early marker of renal impairment. A large clinical randomized trial is needed to strengthen the present study findings.

CONCLUSION

Nephropathy is emerging as one of the major complication of HIV. Many of the patients would have already developed this complication at the time of diagnosis. Renal involvement was seen to be common in present study cohort with HIV. Proteinuria and elevated serum creatinine could be an early marker of HIV associated renal lesions and screening for their presence may be beneficial.

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Ethical approval: The study was approved by the

institutional ethics committee

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