

Renal Function in Antiretroviral Treatment (Art) Naive HIV Positive Patients in A Tertiary Care Centre, South India

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Abstract

Background and objective: Renal disorders are encountered at all stages of HIV infection, and they range from the fluid and electrolyte imbalances commonly seen in hospitalized patients to end-stage renal disease (ESRD). The present study on 30 patients focused on the renal abnormality in ART naïve HIV patients at the time of registration to ART centre.

Methods: All HIV positive patients who were not on ART were recruited for the study and checked for renal impairment at the time of registration to the ART centre.

Results: A total of 30 patients were screened, of these 22 were males and remaining females. Among the 30 HIV positive patients, 20% (n = 6) were found to have renal disease with eGFR < 60 ml/min per 1.73 m², out of which 4 were females. All the 6 patients had CD4 count < 350 cells/cumm and BMI < 20 kg/m². There was no correlation with urine albumin, microscopy and decreased eGFR.

Interpretation and Conclusion: All newly HIV positive patients have to be evaluated for renal abnormalities at the time of diagnosis so that they can be initiated on medication to prolong the onset of HIV associated Nephropathy (HIVAN) and end stage renal disease (ESRD).

Keywords: HIV nephropathy; Renal function; Treatment naïve HIV positive

List of Abbreviations: HIVAN: HIV associated Nephropathy; ART: Antiretroviral Treatment; ESRD: End-stage Renal Disease; TNF: Tenofavir; ACE: Angiotensin Converting Enzyme; ARBs: Angiotensin Receptor Blockers; ICMR: Indian Council of Medical Research

Introduction

Worldwide the overall number of people living with human immunodeficiency virus (HIV) has significantly increased due to new infections and beneficial effects of combination antiretroviral therapy (cART) has brought about a dramatic increase in life expectancy and decreased mortality among people with HIV infection. Kidney disease is now widely recognized as a frequent complication of HIV infection. Other important HIV-associated renal diseases include HIV immune complex kidney diseases and thrombotic microangiopathy [1]. However, other causes of kidney disease related to ART, include renal stones, crystalluria, dysuria, papillary necrosis, acute renal failure caused by indanavir [2]. Tenofavir can cause decreased glomerular filtration rate, tubular toxicity, Fanconi Syndrome (rare) [2]. HIVAN usually presents with nephrotic syndrome, chronic renal failure or in combination. Conditions such as diabetes mellitus, hypertension and vascular disease add to the burden of chronic kidney disease with improvement in the life expectancy of the individual.

Renal disorders are encountered at all stages of HIV infection, and they range from the fluid and electrolyte imbalances commonly seen in hospitalized patients to end-stage renal disease (ESRD). Those individuals who progress to end-stage renal disease while receiving ART may be eligible for renal transplant.

Since patients with HIV are known to develop HIVAN and many of the patients would already have developed this complication at the time of diagnosis, looking for renal abnormalities will help the treating physician to know about the status of renal function at the time of diagnosis as most of the patients will be registered to the ART centre soon after the diagnosis of HIV.

Studying renal function at the time of registration will also have another major implication in the further management of HIV, since

most of the patients are now started on Tenofavir (TNF) based regimen, which is known to cause renal toxicity. If at all the patient is having renal function abnormality, than an ART regimen using other than TNF may have to be initiated. Hence we undertook this study to know the renal function in ART naïve HIV positive patients and to further manage them without causing renal toxicity.

HIV can cause renal complications as HIVAN. This is seen commonly when the CD4 is low. Tenofavir which is used as first line regimen can cause interstitial Nephritis and Fanconi Syndrome as a side effect. So if the patient is already having renal impairment, he or she cannot be started with that regimen.

Research gap

Most of the treating physicians do serum creatinine before starting ART, but they do not concentrate on eGFR. It is better to calculate the eGFR and than initiate on the treatment. Monitoring the patient clinically or doing urine examination is of little use.

Aims and Objectives

To know the number of HIV positive patients affected with renal impairment at the time of registration to the ART centre.

Materials and Methods

This is a single cross sectional study done from July 2015 to August

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2015 at JSS hospital, Mysore, a tertiary care center of south India. Ethical approval and clearance was taken from the Institutional ethical board before starting the study. Written informed consent was obtained from all patients.

Type of study

Cross sectional study of renal function in treatment naive HIV positive patients.

Selection criteria

Before the commencement of this work, a letter of introduction was collected from the Chief Medical Director of the State Hospital Akure to the officer in-charge of Haematology department and contact was made with officers in the Basic Health Center Gbalegi Idanre to explain the purpose of the project and through this means information was obtained on the status of infection, and socio-economic activities of the people using standard questionnaire.

Inclusion criteria: 1. Patients 18 years of age and above 2. Treatment Naïve Patients registered at the ART centre during the study period.

Exclusion criteria: 1. Patients below 18 years of age 2. Antenatal cases 3. Patients diagnosed with Diabetes mellitus, Hypertension and Renal disorders.

A detailed history, clinical examination and laboratory investigations were carried out for all enrolled patients. Information was specifically collected pertaining to age and gender, risk factor/s for HIV infection, complete blood count, urinalysis, blood urea and CD4 counts. Routine urine examination in the form of Albumin and microscopy and serum creatinine was done in ART naïve patients. A patient BMI was calculated and blood was drawn for CD4 count at the time of registration to the ART centre.

Statistical Analysis

All statistical calculation was performed using Statistical Package for Social Sciences (SPSS), version 17.0. Chi-square test was used to compare between different categorical data investigating the effects of gender, age BMI and CD4. eGFR was calculated by Cockcroft and Gault

equation. An eGFR 60 ml/min per 1.73 m² was taken as the cutoff point for significant renal impairment.

Results

A total of 30 patients participated in the study from July 2015 to August 2015 from the ART centre. Out of which 73% (n=22) were males. There was no transgender. 70% (n=21) of the patients belong to the age group 21 to 40.20% (n=6) had a eGFR less than 60.

6 patients with renal disease were in the age group between 35-55years. 67% (n=4) of them were females. All patients with low eGFR had a CD4 count < 350.

Out of 30 patients, 50% (n=15) of people had a BMI <20 kg/m², out of which 40% (n=6) people had eGFR <60 ml/min per 1.73 m²

No one in the study group had renal symptoms like puffiness of face, decreased urine output or edema of lower limb. They did not have any symptoms suggestive of opportunistic infections like Tuberculosis. There was no correlation with urine albumin, microscopy and decreased eGFR. The details of the results are depicted in the Table 1 below.

Discussion

Nephropathy is one of the common complications of HIV. The rate of renal disease in our study was 20%. This correlates with the study done by Wokoma et al. [3] which concluded that renal involvement was found to be common in HIV positive patients with a rate of 17.3%.

All these patients had a CD4 count of <350 cells/cumm which means that lower CD4 count predisposes for developing nephropathy which correlates with the study done by Winston et al. [2].

40% of patients with low BMI had eGFR <60 ml/min per 1.73 m². This correlates with the study done by Wokoma et al. [3].

Among patients with low eGFR, 67% (n=4) of them were females which implies that women are more susceptible to develop nephropathy than men. This may be due to less BMI compared to men. This correlates with the study done by Wokoma et al. [3].

Pre ART No	Age	Sex	Weight (kG)	Height (Cms)	BMI	CD4 Count (Cells)	Serum Creatinine	eGFR
551	38	F	38	148	17.3	244	0.8	57.19
552	45	M	73	173	24.39	405	1	96.31
553	45	M	46	163	17.31	66	0.9	67.43
555	45	F	50	161	19.28	107	1.2	46.73
561	38	M	100	169	35.012	1627	1	141.66
565	66	M	66	174	21.79	342	1	104.5
567	21	M	55	175	17.95	322	0.9	101
571	40	M	47	169	16.45	78	1.1	59.34
572	34	F	55	159	21.75	238	1.1	68.82
573	30	M	60	164	22.3	139	0.8	114.58
574	36	M	49	160	19.14	200	0.7	101.11
575	25	M	65	174	21.46	281	0.9	115.35
583	42	F	43	157	17.44	127	0.8	62.18
586	25	M	63	165	23.14	150	0.8	125.78
587	25	M	67	169	23.45	275	0.9	118.9
596	38	F	38	151	16.66	217	0.8	57.19
597	40	M	56	166	20.33	438	1.1	70.7
600	22	F	53	149	23.87	570	1	73.83
604	55	F	45	150	20	36	1	45.15
607	26	M	85	175	27.75	426	1	129.2

608	30	M	58	182	17.5	556	1.2	73.84
610	29	M	64	165	23.5	434	0.8	123.33
611	54	M	45	150	20	348	0.9	59.72
612	35	M	42	150	18.6	340	0.8	76.56
614	57	F	60	155	24.97	352	0.8	73.48
616	31	M	53	179	16.54	138	0.7	114.62
619	46	M	58	166	21.04	900	1	75.72
620	29	M	49	170	16.9	827	0.9	83.93
627	36	M	46	165	16.89	27	0.9	73.82

Table 1: Descriptive characteristics of the study.

6 patients with renal disease were in the age group between 35-55 years which implies older the patients they are more susceptible to develop renal disease. This correlates with the study done by Wokoma et al. [3].

In our study, none of them had renal symptoms, this suggests that patients can develop renal abnormality even without symptoms like puffiness of face, decreased urine output or edema of lower limb. Treating team should be aware of this. This correlate with the study done by Roling et al. [4].

Nobody in the study group had any opportunistic infections. This shows that the patients need not have any opportunistic infections to develop renal abnormality. This correlates with the study done by Sulkowski et al. [5].

In our study there was no correlation between the urinary examination findings and the eGFR. Patients with low eGFR had a normal urinary findings. This shows that the patients' eGFR has to be monitored rather than concentrating on urinary examination. This correlates with our study done by Kumar et al. [6].

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. Indians are also more prone for HIVAN as compared to some of the patients from Africa. So knowing the renal status of the patient by doing simple bedside tests at the time of diagnosis of HIV and before initiating ART will help in managing them

by starting them on an ART regimen other than Tenofavir (TNF) or modified dose of TNF depending upon eGFR as it is known to cause renal toxicity.

Another advantage is that if the patients develop HIV Nephropathy, drugs like Angiotensin Converting Enzyme (ACE) Inhibitors, Angiotensin Receptor Blockers (ARBs) and Steroids can be tried to prolong the onset of ESRD.

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