Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE7, 2023

Original Research Article

To study the renal functions in Adult HIV patients taking first line HAART initiation using estimated Glomerular Filtration Rate (eGFR).

Dr. Prof. Rakesh Gaharwar[1] (Professor), Dr. Dinkar Dubey[2] (Registrar Consultant), Dr. Sudhanashu Sharma[3] (PG Student), Dr. Nitesh Mudgal[4] (PG Student)

Dept. of Medicine, GRMC, Gwalior, M.P.[1,3&4]
Artemis Hospitals, Gurugram[2]

Corresponding Author: Dr. Nitesh Mudgal

Abstract:

Background & Method: The aim of the study is to study the renal functions in Adult HIV patients taking first line HAART initiation using estimated Glomerular Filtration Rate (eGFR). The 100 newly diagnosed HIV positive patients were included in the study. Detailed history – including duration of disease, any past history of antiretroviral drug and other medications , treatment regimen started , WHO staging of the HIV disease were obtained .

Result: Out of 100 patients, at the end of study 21% patients with Normal GFR (>90), 34% with mild reduction (60-90) and 45% with moderate to severe reduction in eGFR (<60), 10 months after initiating ART, with majority of GFR decline in Tenofovir based regimens. The patients were distributed in all the clinical stages of HIV disease from T1 to T4.Majority of HIV patients were in WHO clinical stage T1 (61%) followed byT4(15%) and 12% T2 & T3 respectively.

Conclusion: This study signifies that Tenofovir based regimen is the basis for most of the decline in renal function in patients on ART. Renal dysfunction is highly prevalent in the study population. The mean age of presentation in our study population was 40.70 years. There is significant correlation between age and eGFR. In our study 44 % are females, 56% are male. The difference of average in eGFR between male and female is not statistically significant. Mean weight is 49 Kg. No significant correlation between weight and decline in eGFR.

Keywords: Renal, Adult, HIV, HAART, eGFR.

Study Designed: Cross sectional study

1. Introduction

Human immunodeficiency virus infection has become a public health challenge in the modern world today. About 38 million people were living with HIV at the end of 2021 globally (1) and 23.5 lac people in India (2). Infection with the HIV affects several body organs and systems, including the kidneys. The kidneys are the primary means for eliminating waste products of metabolism that are no longer needed by the body. These products include urea, creatinine, uric acid, bilirubin and metabolites of various hormones. These waste products must be eliminated from the body as rapidly as they are produced. Most

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE7, 2023

toxins which are produced by the body or ingested and other foreign substances such as pesticides, drugs, and food additives are also eliminated through the kidneys.
Renal dysfunction is very common complication of HIV infection. It has a prevalence of 30% in HIV infected patients. It can range from exacerbation of common kidney diseases to acute and chronic conditions (3). The cause of renal dysfunction are multifactorial which includes HIV infection per se, various opportunistic infections, other co-morbidities, and ART Therapy . AIDS-related kidney disease, especially HIVAN (HIV associated Nephropathy) has now become a common cause of end-stage renal disease (ESRD) requiring renal replacement therapy and may be associated with progression to AIDS and death (4). Renal damage caused by HAART can result in a variety of toxic drug effects presenting as an acute renal failure, tubular necrosis, kidney stones, or chronic renal disease (5).

2. Material & Method

100 patients who are attending ART clinic and admitting in Medical units at Gajraraja Medical College Hospital were randomly selected as per the inclusion and exclusion criteria. Out of these, 56 were men and 44 were women. The mean age of subjects was 40.70 years with a range of 18-80 years. Written informed consent was obtained from each HIV positive patients enrolled in the study.
The 100 newly diagnosed HIV positive patients were included in the study. Detailed history – including duration of disease, any past history of antiretroviral drug and other medications , treatment regimen started , WHO staging of the HIV disease were obtained .
Patients were examined in detailed for assessing any symptoms and signs of renal failure. Blood samples were taken for screening baseline renal function for urea, creatinine. Baseline eGFR was calculated using Cockgroft – Gault equation. Patients were followed up over a period of 12 months and any opportunistic infections developed among patients during study period was noted. At the end of 12 months, patients were assessed for Urea , Creatinine by drawing blood samples and eGFR was calculated using CG formula. Urine routine and USG KUB was done.

INCLUSION CRITERIA:

1. All newly diagnosed adult HIV positive patients who are attending ART clinic and will be started on HAART at Jayarogya group of Hospitals Gwalior.

EXCLUSION CRITERIA:

1. Patients with Chronic renal failure
2. Patients with diagnosed systemic causes of renal diseases (eg., SLE, Systemic Sclerosis, Rheumatoid arthritis, and other rheumatological & connective tissue disorders)
3. Patients who are known Diabetic or Hypertensive or any other comorbid illness.
4. Pregnant women and children age less than 15 years
5. Patients with poor adherence (> 80 %)
6. Patients receiving other nephrotoxic drugs / NSAIDS.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE7, 2023

3. Results

Table 1: Distribution of cases according to Age

Age Group (years)	No. of Cases	Percentage
Less than 20	4	4.0
21-30	17	17.0
31-40	34	34.0
41-50	27	27.0
51-60	12	12.0
More than 60	6	6.0
Total	100	100.0
Mean±SD	40.70±11.92	

Out of 100 cases, there were 4(4%) cases were less than 20 years of age, 17(17%) cases were 21-30 years of age, 34(34%) cases belong to 31-40 years of age,27(27%) belong to 41-50 years of age, 12(12%) belong to 51-60 years of age and 6(6%) belong to more than 60 years of age. Most of the patients in the study are in the age group of 31 to 40 (3rd and 4th decade) with majority in 31–40 (34%).Mean age was 40.70±11.92 years. Among them patients were distributed across the age spectrum of 18 to 80 years.

Table 2: Staging of kidney damage based on eGFR (Baseline)

eGFR (Baseline)	No. of Cases	Percentage
Moderate to Severe	21	21.0
Mild	54	54.0
Normal	25	25.0
Total	100	100.0

Out of 100 patients, at the baseline 25% patients with Normal GFR (>90), 54% with mild reduction (60-90) and 21% with moderate to severe reduction in eGFR (<60).

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE7, 2023

Table 3: Staging of kidney damage based on eGFR (END of Study)

Baseline	No. of Cases	Percentage
Mild	34	34.0
Moderate to Severe	45	45.0
Normal	21	21.0
Total	100	100.0

Out of 100 patients, at the end of study 21% patients with Normal GFR (>90), 34% with mild reduction (60-90) and 45% with moderate to severe reduction in eGFR (<60), 10 months after initiating ART, with majority of GFR decline in Tenofovir based regimens.

Table 4: WHO clinical staging after ART

Clinical Staging	No. of Cases	Percentage
T1	61	61.0
T2	12	12.0
T3	12	12.0
T4	15	15.0
Total	100	100.0

The patients were distributed in all the clinical stages of HIV disease from T1 to T4.Majority of HIV patients were in WHO clinical stage T1 (61%) followed byT4(15%) and 12% T2 & T3 respectively.

4. Discussion

A total of 100 patients diagnosed to have HIV infection were recruited for this study. They were recruited from ART clinic (90% data) and Medical Units at GajraRaja Medical College Hospital during the period of Jan2021-Jan 2022 over 12 months after fulfilling inclusion and exclusion criteria(6).

The finding that majority of renal dysfunction may be present in HIV infected outpatients initiating ART has important ramifications given the increasingly widespread use of Tenofovir , a first line regimen recommended by WHO with known renal toxicity. In our study 71% of patients were in Tenofovir based regimen(7).

Most of the patients in the present study were males in the age group of 31-40 and the mean age of the patients in the present study was 40.70 years.

In the present study, the baseline eGFR in majority of patients comes under category 60-90 and 12 months after intiation of HAART , majority of patients falls under the category < 60ml/min . 16 % has fall down from >90 and 60 to 90 eGFR to < 60 ml/min eGFR following

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE7, 2023

ART therapy . So, Overall prevalence of renal dysfunction is 16% after ART(8). This indicates that ART use has impact on renal function which can be predicted by decline in eGFR. Percentage and mean decline in eGFR is compared to other trials.

5. Conclusion

This study signifies that Tenofovir based regimen is the basis for most of the decline in renal function in patients on ART. Renal dysfunction is highly prevalent in the study population. The mean age of presentation in our study population was 40.70 years. There is significant correlation between age and eGFR. In our study 44 % are females, 56% are male. The difference of average in eGFR between male and female is not statistically significant. Mean weight is 49 Kg. No significant correlation between weight and decline in eGFR.

6. References

1. Mc Culloch MI, Ray PE. Kidney disease in HIV- positive children.Semin Nephrol.2008 Nov;28(6):585-94
2. Winston J.A, Klotman M.E, Klotman P.E: HIV – associated nephropathy is a late , not early, manifestations of HIV -1 infection. Kidney Int. 1999; 55: 1036-1040.
3. Röling J, Schmid H, Fischereder M, Draenert R, Goebel FD. HIVassociated renal diseases and highly active antiretroviral therapy-induced nephropathy. Clin Infect Dis 2006;42:1488-95.
4. L. J. Campbell, F. Ibrahim, M. Fisher, S. G. Holt, B. M. Hendry, and F. A. Post, "Spectrum of chronic kidney disease in HIV-infected patients," HIV Medicine, vol. 10, no. 6, pp. 329–336, 2009.
5. S. Hegde, C. Singh, and B. Ohare, "HIV-associated nephropathy in the setting of maximal virologic suppression," Pediatric Nephrology, vol. 26, no. 6, pp. 973–977, 2011.
6. S. Tzur, S. Rosset, R. Shemer et al., "Missense mutations in the APOL1 gene are highly associated with end stage kidney disease risk previously attributed to the MYH9 gene," Human Genetics, vol. 128, no. 3, pp.345–350, 2010.
7. Zeng M, Southern PJ, Reilly CS, Beilman GJ, Chipman JG, Schacker TW, Haase AT. Lymphoid tissue damage in HIV-1 infection depletes naïve T cells and limits T cell reconstitution after antiretroviral therapy. PLoS Pathog. 2012;8:e1002437.
8. Levy JA. Virus-host interactions in HIV pathogenesis: directions for therapy. Adv Dent Res. 2011;23:13–18.