TO DETERMINE THE IMPACT OF ART ON RENAL DISEASES IN HIV PATIENTS

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Abstract

Method: This study was done at Department of Medicine, Amaltas Institute of Medical Sciences, Dewas. All patients admitted with malaria during the study period Feb 2019 to Jan 2020 were taken for the study after considering the inclusion and exclusion criteria.

Result: Among those patients on ART, 52.6% were on Zidovudine based regimen and 47.4% were on Tenofovir based regimen. 39.1% patients among those who had renal dysfunction were on Zidovudine based regimen and 60.9% patients were receiving Tenofovir based regimen. Among those patients on Zidovudine based regimen, 6.9% patients had renal dysfunction whereas 11.9% patients on Tenofovir based regimen had renal dysfunction. The relation between regimen of ART and risk of renal dysfunction was analyzed using Two sample T test and CI and found to be non significant.

Conclusion: Study shows that there is no association between risk of renal dysfunction with gender, duration of illness and duration of HAART in HIV positive patients. It also shows there is no significant association between the regimen of HAART and the risk of renal dysfunction. ART may have predilection for causing renal damage especially from NNRTI group like Tenofovir, which was found to cause renal toxicity. Our study indicates a need for frequent monitoring of renal functions and early initiation of HAART in HIV positive patients specially in relation to commonly available ART in our country.

Keywords: Impact, Renal Diseases, HIV & AIDS.

Introduction

India has the third largest HIV epidemic in the world. In 2013, HIV prevalence in India was estimated 0.3 percent. This figure is small compared to most other middle-income countries but because of India’s huge population (1.2 billion) this equates to 2.1 million people living with HIV2. In the same year an estimated 130000 people died from AIDS related illness3. Children (<15 yrs) account for 7% (1.45lakh) of all infections, while 86% are in the age group of 15-49 years. Of all HIV infections, 39% (8.16lakh) are among women. The estimated number of PLHIV in India maintains a steady declining trend from 23.2lakh in 2006 to 21lakh in 2011.²

HIV infects multiple organs and kidney is a common target. With dramatic improvements in survival and disease progression in the era of antiretroviral therapy(ART), complications such as kidney, liver and cardiac diseases have largely replaced opportunistic infections as the leading causes of mortality in HIV patients4. Patients with HIV are at risk for both Acute kidney injury(AKI) and Chronic kidney diseases(CKD) like medication nephrotoxicity, HIV associated nephropathy(HIVAN), immune complex kidney disease, kidney diseases in the setting of thrombotic microangiopathy, secondary to Hepatitis B or C virus co-infection and co morb id diabetes and hypertension etc.³

Material & Method

This study was done at Department of Medicine, Amaltas Institute of Medical Sciences, Dewas. All patients admitted with malaria during the study period Feb 2019 to Jan 2020 were taken for the study after considering the inclusion and exclusion criteria.

INCLUSION CRITERIA:

All HIV positive patients aged more than 18 years attending ART centre, General medicine OPD, and those admitted in Medicine wards of MGM Medical College and M.Y. Hospital.

EXCLUSION CRITERIA:

1. Patients with pre existing chronic kidney diseases not related to HIV(Renal disease due to Diabetes Mellitus, Systemic Hypertension, Collagen vascular diseases etc).
2. Patients in acute/serious illness.
3. Patients having confounding factors for proteinuria (such as heavy exercise, cardiac failure, hyperglycaemia, uncontrolled hypertension and urinary tract infection)
4. Patients with multisystem diseases or malignancies.
5. Pregnant ladies.
6. Patients on nephrotoxic medications.

**STATISTICAL METHOD:**

Suitable parametric and non parametric tests (Chi square test for non continuous variables, Analysis of variance for continuous variables, Z test etc).

**Results**

**Table 1: Relation between Regimen of ART and renal dysfunction**

<table>
<thead>
<tr>
<th>ART regimen</th>
<th>Serum Creatinine</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; 1.5 %</td>
<td>&lt; 1.5 %</td>
</tr>
<tr>
<td>Group A</td>
<td>9</td>
<td>122</td>
</tr>
<tr>
<td>Group B</td>
<td>14</td>
<td>104</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>226</td>
</tr>
</tbody>
</table>

Group A – Zidovudine based regimen, Group B – Tenofovir based regimen

**Table 2: Two-Sample T-Test and CI: Renal dysfunction and ART regimen**

<table>
<thead>
<tr>
<th>Sex</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>SE Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>131</td>
<td>0.731</td>
<td>0.325</td>
<td>0.028</td>
</tr>
<tr>
<td>Group B</td>
<td>118</td>
<td>0.807</td>
<td>0.385</td>
<td>0.035</td>
</tr>
<tr>
<td>T-Value</td>
<td>-1.69</td>
<td>P-Value = 0.093</td>
<td>DF = 249</td>
<td>Non significant</td>
</tr>
</tbody>
</table>

Among those patients on ART, 52.6% were on Zidovudine based regimen and 47.4% were on Tenofovir based regimen. 39.1% patients among those who had renal dysfunction were on Zidovudine based regimen and 60.9% patients were receiving Tenofovir based regimen. Among those patients on Zidovudine based regimen, 6.9% patients had renal dysfunction whereas 11.9% patients on Tenofovir based regimen had renal dysfunction.

The relation between regimen of ART and risk of renal dysfunction was analyzed using Two sample T test and CI and found to be non significant.

**Discussion**

In our study, 11.9% patients among those who were not on HAART had renal dysfunction whereas only 9.6% patients among those on HAART had renal dysfunction. The relation between treatment status and renal dysfunction was analyzed using two sample T test and CI, and it showed a significant correlation (P value = 0.000). Thus our study showed that the risk of renal dysfunction is higher in those HIV patients who are not on HAART than those on HAART. The renoprotective role of HAART was also showed in the study done by Gupta et al.

In another prospective cohort study done in 3329 patients who initiated ART under routine clinical care, ART initiation significantly slowed the rate of renal function decline over a median follow up of 4.8 years (loss of 1.4 after versus 2.2 mL/min per 1.73 m2 per year before initiation).

In our study 71.2% of the patients with renal dysfunction had CD4 count less than 200. 25% of patients with CD4 count less than 200 developed renal dysfunction whereas only 4.5% patients among those with CD4 more than 200 developed renal dysfunction. Relation between CD4 count of the patients and the risk of renal dysfunction was analyzed using Pearson correlation of both values and showed a significant correlation (P value = 0.000). Thus our study showed that low CD4 count is significant risk factor for renal dysfunction in HIV patients. The studies done by Jotwani V et al and Kalayjian RC et al also showed that low CD4 count is a strong risk factor for chronic kidney diseases in HIV positive patients.

**Conclusion**

Study shows that there is no association between risk of renal dysfunction with gender, duration of illness and duration of HAART in HIV positive patients. It also shows there is no significant association between the regimen of HAART and the risk of renal dysfunction. ART may have predilection for causing renal damage especially from NNRTI group like Tenofovir, which was found to cause renal toxicity. Our study indicates a need for frequent monitoring of renal functions and early initiation of HAART in HIV positive patients specially in relation to commonly available ART in our country.

**References**


