VOLUME-7, ISSUE-4, APRIL-2018 • PRINT ISSN No 2277 - 8160

Original Research Paper

Nursing

THE EFFECT OF TENOFOVIR IN LIVER FUNCTION TEST &RENAL FUNCTION TEST WHEN TENOFOVIR GIVEN AS FIRST LINE ANTI RETROVIRAL THERAPY IN HUMAN IMMUNE VIRUS INFECTED PATIENT.

Dr Kapildev Mondal Assistant professor, department of general medicine,Murshidabad medical college & hospital,westbengal,India.

Dr Md Mohiuddin Sk* R.M.O cum clinical tutor,department of general medicine,Murshidabad medical college & hospital,westbengal,India.* Corresponding Author

KEYWORDS : Enhancement, comprehensive teaching Program, Staff nurses, Knowledge

Introduction &Background :
Tenofovir has been recently introduced in our country as first line therapy in HIV infection but limited data available on safety profile (special concern is its association with nephrotoxicity & hepatotoxicity).

The main concern are Nephrotoxicity &hepatotoxicity of Tenofovir and the study will focus on toxicity particularly nephrotoxicity &hepatotxicity of Tenofovir in Tenofovir based 1st line ART.

Methods:
We took approval from Institutional ethics committee & Informed consent from all the study subjects. We studied subjects from July to December 2014 and followed up of each for 6 months,collected detailed history did physical examinations and baseline investigations before initiation of ART and subsequently at 2weeks, 1 month, 3 month and 6 month of starting of ART.We assessed tolerability to the regimens by symptoms of patients (nausea, vomiting, loss of appetite etc) and laboratory tests report.We collected all data data & analyzed by using SPSS.

Discussion:
HIV infection causes significant morbidity and mortalityby causing an immune deficient state and patients usually succumb to death from unusual opportunistic infections and malignancies. However HIV infection is a manageable with HAART. We conducted the study involving 97 eligible patients who were followed up for a period of 6 months. We studied toxicity and tolerability of tenofovir.

We observed gastrointestinal intolerance which includes anorexia, nausea, vomiting and upper abdominal pain in 12.37% patients at 2 weeks of starting of ART which subsequently relieved with time. Only 4% patients had GI intolerance at 1 month which relieved after few days. We found that there is increment in mean haemoglobin level of total study population from base line value. There was no effect on mean total and differential leucocyte count and also on the mean platelet count.

We found no adverse effect of the drug on liver function (serum bilirubin, SGOT, SGPT did not show any change).

The study showed that there is increasing value of mean serum creatinine level of total study population from base line value but mean serum creatinine at the end of study remained within normal reference value. None of the study population developed acute renal failure or feature of proximal renal tubular dysfunction (glycosuria in presence of normal plasma glucose and proteinurea) for which discontinuation of tenofovir required. The pattern of change in serum creatinine level is same in both sex group.

We also found that there was increasing value of mean serum urea level of the total study population from base line value although the value at the end of study remained within normal reference value.

We found there is clinical, biochemical and improvement of overall health in general of the study population probably due to well control of the disease and also the control of opportunistic infection.The study population had overall weight gain at the end of the study

Results:
This study shows that tenofovir is well tolerated drug in this population of patients with once daily regimen which has improved patients compliance. Tenofovir therapy improves overall general health of the patients.Tenofovir therapy is associated with mean weight gain and increased in haemoglobin level. Within this 6 month follow up, evidence of nephropathy or proximal renal tubulopathy&hepatotxicity is not seen in any study subject.

Conclusion: Tenofovir is well tolerate and very safe drug in these patients without prior renal disease and concurrent nephrotoxic drugs, the follow up of these patients should be done to know the exact incidence of nephropathy as literature has concerned us about the possibility of renal toxicity with tenofovir with prolonged exposure.Tenofovir has no hepatotoxic & renotoxic effect.

Ethical Considerations :The Institutional Ethics Committee of Murshidabad medical college approved for our study.

Acknowledgement:
We are grateful and indebted to respected Principal Sir, MSVP Sir, Deputy Superintendent and Assistant Superintendents for being of help whenever needed.

Source of funding:We expend from our personal account.

Abbreviation
HIV- Human Immunodeficiency Virus.
SIV- Simian Immunodeficiency Virus.
AIDS- Acquired Immunodeficiency Syndrome.
AZT –Zidovudine.
HAART- Highly active antiretroviral therapy.
NNRTI -Non-nucleoside reverse trancriptase inhibitor.
TDF-Tenofovir disoproxil fumarate.
NACO-National Aids control organization.
ART-Antiretroviral therapy.
PrEP-Pre-exposure prophylaxis.
Sd- Standard deviation.
Hb-Haemoglobin.
TLC-Total leucocyte count.
DLC-Differential leucocyte count.
LFT-Liver function test.
ALT-Alanine transaminase.
NBMC-North Bengal medical college Diagram 1: Distribution of total study population according to age

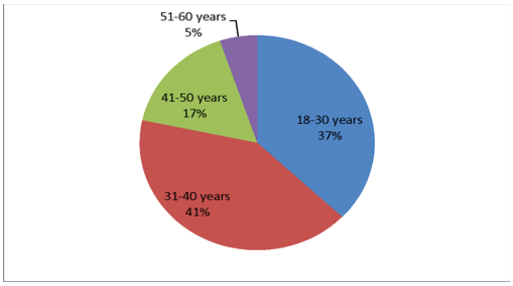
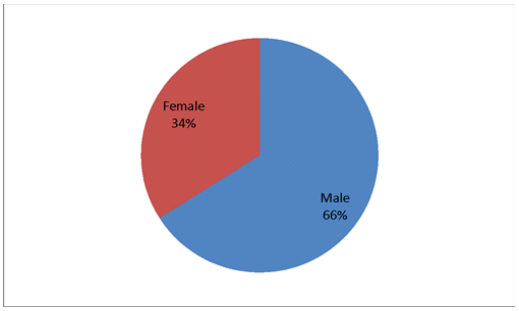


Diagram 2: Distribution of total population according to sex distribution



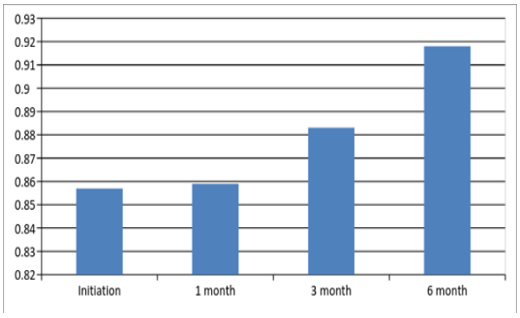


Figure 1:Change in mean serum creatinine level of total study population observed during the study period.

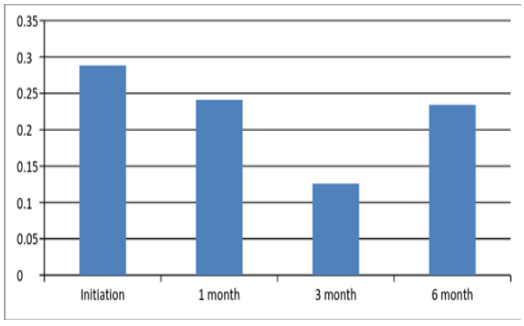


Figure 2: Change in serum direct bilirubin level (mean+/-Sd) of total study population observed during the study period .

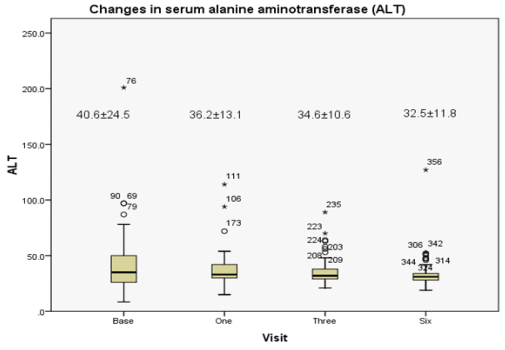


Figure 3: Changes in serum alanine aminotranferaseTable 1:

Table 1 Tenofovir and renal parameter:

Parameter	At initiation	At 1 month	At 3 month	At 6 month
Serum Urea(mean+/-Sd)	21.431+/-5.21	20.784+/-3.14	21.928+/-3.14	22.928+/-3.7
Serum Creatinine(mean+/-Sd)	0.857+/-0.169	0.859+/-0.109	0.883+/-0.1	0.918+/-0.125
Urine for Protein	Trace in 5 pts	Nil	Nil	Nil
Urine for glucose	Present in 1 pts	Nil	Nil	Nil

References

1. Santiago ML, Range F, Keele BF, Li Y, Bailes E, Bibollet-Ruche F, et al. Simian immunodeficiency virus infection in free-ranging sooty mangabeys (Cercocebus atys atys) from the Tai Forest, Cote d'Ivoire: Implications for the origin of epidemic human immunodeficiency virus type 2. J Virol.2005;79:12515–27.
2. Stone VE. Strategies for optimizing adherence to highly active antiretroviral therapy: lessons from research and clinical practice. Clin Infect Dis. 200115;33:865–72.
3. Anon. Rapid Advice: Antiretroviral Therapy for HIV Infection in Adults and Adolescents. Geneva, Switzerland: World Health Organization 2009. Beatriz Fernandez-Fernande, Ana Montoya-Ferrer et al. AIDS Res Treat. 2011;354908.
4. Anti Retroviral Therapy for HIV infected Adults and Adolescents Including Post-exposure Prophylaxis. NACO. Ministry of Health & Family Welfare, Government of India. 2007;A9:37.
5. WHO. Anti Retroviral Therapy For HIV infected Adults and Adolescents 2010(revision).
6. Srinivas RV, Fridland A. Antiviral activities of 9-R-2phosphonomethoxypropyl adenine (PMPA) and bis(isopropyloxymethylcarbonyl)PMPA against various drug-resistant human immunodeficiency virus strains. Antimicrob Agents Chemother. 1998;42:1484–7.
7. Robbins BL, Srinivas RV, Kim C, Bischofberger N, Fridland A. Anti-human immunodeficiency virus activity and cellular metabolism of a potential prodrug of the acyclic nucleoside phosphonate 9-R-(2 phosphonomethoxypropyl)adenine(PMPA),Bis(isopropyloxymethylcarbonyl)PMPA. Antimicrob Agents Chemother.1998;42:612–7.
8. Kearney BP, Flaherty JF, Shah J. Tenofovir disoproxil fumarate: clinical pharmacology and pharmacokinetics. Clin Pharmacokinet. 2004;43:595–612.
10. Van Gelder J, Deferme S, Naesens L, De Clercq E, van den Mooter G, Kinget R, et al. Intestinal absorption enhancement of the ester prodrug tenofovir disoproxil fumarate through modulation of the biochemical barrier by defined ester mixtures. Drug Metab Dispos. 2002;30:924–30.
11. Barditch-Crovo P, Deeks SG, Collier A, Safrin S, Coakley DF, Miller M, et al. Phase i/ii trial of the pharmacokinetics, safety, and antiretroviral activity of tenofovir disoproxil fumarate in human immunodeficiency virus infected adults. Antimicrob Agents Chemother. 2001;45:2733–9.
12. Hajjar AM, Lewis PF, Endeshaw Y, Ndinya-Achola J, Kreiss JK, Overbaugh J. Efficient isolation of human immunodeficiency virus type1 RNA from cervical swabs. J Clin Microbiol. 1998;36:2349–52.
13. Cundy KC, Sueoka C, Lynch GR, Griffin L, Lee WA, Shaw JP. Pharmacokinetics and bioavailability of the anti-human immunodeficiency virus nucleotide analog 9-[(R)-2-(phosphonomethoxy)propyl]adenine (PMPA) in dogs. Antimicrob Agents Chemother. 1998;42:687–90.
14. Robbins BL, Greenhaw J, Connelly MC, Fridland A. Metabolic pathways for activation of the antiviral agent 9-(2-phosphonylmethoxyethyl)adenine in human lymphoid cells. Antimicrob Agents Chemother. 1995;39:2304–8.
15. Robbins BL, Wilcox CK, Fridland A, Rodman JH. Metabolism of tenofovir and didanosine in quiescent or stimulated human peripheral blood mononuclear cells. Pharmacotherapy. 2003;23:695–701.
16. Bazzoli C, Jullien V, Le Tiec C, Rey E, Mentre F, Taburet AM. Intracellular Pharmacokinetics of Antiretroviral Drugs in HIV-Infected Patients, and their Correlation with Drug Action. Clin Pharmacokinet. 2010;49:17–45.
17. Kearney B, Flaherty J, Sayre J. A multiple-dose randomized, crossover drug interaction study between tenofovir DF and lamivudine or didanosine. The1st IAS Conference on HIV Pathogenesis and Treatment, Buenos Aires.2001 Jul 8–11.
18. Pruvost A, Negredo E, Theodoro F, Puig J, Levi M, Ayen R, et al. Pilot pharmacokinetic study of human immunodeficiency virus-infected patients receiving tenofovir disoproxil fumarate (TDF): investigation of systemic and intracellular interactions between TDF and abacavir, lamivudine, or lopinavir-ritonavir. Antimicrob Agents Chemother. 2009;53:1937–43.
19. Palella FJ Jr, Delaney KM, Moorman AC, Loveless MO, Fuhrer J, Satten GA, et al. Declining morbidity and mortality among patients with advanced human immunodeficiency virus infection. HIV Outpatient Study Investigators. N Engl J Med. 1998;338:853-60.
20. Hammer SM, Squires KE, Hughes MD, Grimes JM, Demeter LM, Currier JS, et al. A controlled trial of two nucleoside analogues plus indinavir in persons with human immunodeficiency virus infection and CD4 cell counts of 200 per cubic millimeter or less. AIDS Clinical Trials Group 320 Study Team. N Engl J Med. 1997;337:725-33.