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Original Research Article

To Evaluate the Outcome of Second Line Anti-Retroviral Therapy in HIV Positive Patients at Tertiary Care Centre

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Abstract

Background: Roughly 4% of the 1.25 million patients on antiretroviral therapy (ART) in Asia are using second-line therapy. To maximize patient benefit and regional resources it is important to optimize the timing of second-line ART initiation and use the most effective compounds available.

Methods: This prospective study w as carried out at a tertiary care hospital among HIV-infected patients who was failed on first-line treatment and started on second-line HAART during October 2020 to September 2021 and formed the cases of the study and registered at ART centre, Ajmer. Ethical approval was obtained from the Institutional Ethics Committee of this institution.

Result: In our study at baseline of 2nd line ART initiation mean CD4 cell count was 299.04 cells/ul ; at 6 months of 2nd line ART therapy mean CD4 cell count was 334.24 cells/ul and at 12 months mean CD4 cell count was 396.82 cells/ul. Change in CD 4 count from 6 months to baseline was 35.20 (P value 0.001) and change in CD 4 count from 12 months to baseline was 97.78(P value 0.001). The mean CD4 cell count is found to be increased from baseline to successive follow-ups. The increase in CD4 count is statistically significant (P value <0.05) at 6 and 12 months from baseline.

Conclusion: Second line ART was found to achieve statistically significant (P value <0.05) clinical effectiveness (weight increase), virological effectiveness (viral load decrease), immunological effectiveness (CD4 count increase) at 6 and 12 months from baseline.

Keyword: CD4 count, HIV, Weight, Virological Effectiveness.

Introduction

In India, under the banner of National AIDS Control Organization (NACO) various ART centers have been opened where these drugs are provided free of cost. The second line ART regimens comprised of zidovudine (ZDV), lamivudine (3TC), tenofovir (TDF), and boosted lopinavir/ritonavir (LPV/r) have been introduced recently in a phase wise manner at various centers. The criteria to switch on second line ART are clinical and/or immunological and/or virologic failure in a

patient, who had received 6 months or more of standard first-line ART,

1. If CD4 declines to pre-ART values,
2. If CD4 drops to less than 50% of peak achieved on-treatment value.
3. Failure to achieve CD4 greater than 100 c/mm3 (immunologic Failure)
4. Develops a new WHO stage III/IV AIDS defining illness (clinical failure),
5. Those with HIV RNA 1000 c/ml or greater (virological failure). [1]

The second line regimen as compared to its counterpart has been less studied. Without resistance testing and 6 monthly virological monitoring, the consequences of second line therapy outcomes are unclear. Thus, it is very important to assess the clinical, virological, and immunological effectiveness and treatment outcome of those patients who were switched to second line therapy from their first line ART due to various reasons. In our study we accessed the clinical, virological and immunological effectiveness and treatment outcome over the one year of follow- up in our patients who were switched to the second line. [2,3]

Material And Method

Study Location: ART Centre, JLN Hospital, Ajmer

Study Population: This prospective study w as carried out at a tertiary care hospital among HIV infected patients who was failed on first-line treatment and started on second-line HAART during October 2020 to September 2021 and formed the cases of the study and registered at ART centre, Ajmer. Ethical approval was obtained from the Institutional Ethics Committee of this institution.

Study Design: Observational study

Inclusion Criteria:

1. Age >18 years.
2. HIV positive patients who are the failure on the 1st line ART.
3. Must was switched to second line ART from October 2020 to September 2021 at ART center Ajmer.

Exclusion criteria:

1. Age < 18 years
2. Pregnant women
3. Any severe illness within 1 month of evaluation
4. Patient not giving consent for the study.

Methodology

The baseline data of the patients was recorded in pre-tested case record form. Each patient was followed-up every month for clinical assessment (body weight, WHO stage, opportunistic infections) and till completion of 1 year of second line treatment. CD4 count was monitored at baseline, 6 and 12 months while plasma viral load (PVL) was tested at baseline, 6 and 12 months after switching to second line ART regimen. However, patients who was failed to show virologic suppression (<400 copies/ml) at 6 months, PVL was repeated at 12 months. Patients were offered adherence counseling at each visit. Adherence to second line ARDs will be assessed by pill count. Treatment outcome was assessed with variables like Weight Gain, WHO clinical stage of AIDS, CD4 count and viral load

Statistical Analysis

Statistical analysis was performed using SPSS 20 software and the analyzed data was expressed in percentages. P-value equal to or less than 0.05 was considered to be significant.

Results

Table 1: General characteristics

Mean Age		43.29 ± 10.26 years
Male: Female		50:50
Past history	**Hepatitis B**	2
	VDRL+	1

Table 2: Outcome

	At baseline	At 6 months	At 12 months	p-value
Treatment Adherence (Adherent)	94	90	92	0.99
Weight in kg	57.83±15.08	58.66±14.44	60.12±14.62	0.583
Viral Load(copies/ml)	333825.00±1547793.05	27431.41±1547793.05	20548.99±80499.44	0.03
CD4 Cell Count (cells/µL)	299.04±159.42	334.24±142.18	396.82±195.39	0.02

Table 3: Effectiveness in patients who are switch to the second line ART

		Paired Differences		P value
		Mean	SD	
Change in Weight (Kg)	**6 months - Baseline**	0.83	5.67	0.147
	12 months - Baseline	2.29	6.21	0.001
Change in CD4 count	**6 months - Baseline**	35.20	101.61	0.001
	12 months - Baseline	97.78	163.60	0.001
Change in Viral Load	**6 months - Baseline**	-306393.59	1533451.88	0.048
	12 months - Baseline	-313276.01	1544189.35	0.045

- Weight increased (clinical effectiveness) statistically insignificant (P value >0.05) at 6 months from baseline and statistically significant (P value <0.05) at 12 months from baseline.
- CD4 count increased (Immunological effectiveness) statistically significant (P value <0.05) at 6 and 12 months from baseline.
- Viral load decreased (virological effectiveness) statistically significant (P value <0.05) at 6 and 12 months from baseline.

Discussion

In our study at baseline of 2nd line ART initiation mean CD4 cell count was 299.04 cells/ul ; at 6 months of 2nd line ART therapy mean CD4 cell count was 334.24 cells/ul and at 12 months mean CD4 cell count was 396.82 cells/ul. Change in CD 4 count from 6 months to baseline was 35.20 (P value 0.001) and change in CD 4 count from 12 months to baseline was 97.78(P value 0.001). The mean CD4 cell count is found to be increased from baseline to successive follow-ups. The increase in CD4 count is statistically significant (P value <0.05) at 6 and 12 months from baseline.

Significant improvement in immunity was observed clinically with an increase in mean CD4 count in study by Zhao Y et al [4]

The median CD4 count was 366, 444 , and 522 cells/mm3 at 12,24 and 36 months of initiation of treatment with second line ART, respectively in study by Win MM et al [5]

Median CD4 cell count rose to 228 cells/mm3 rapidly by 6 months of second-line treatment and greater than 300 cells/mm3 by month 18 of second-line ART in study by Murphy R et al [6]

In our study at baseline of 2nd line ART initiation mean viral load was 333825 copies/ml ; at 6 months of 2nd line ART therapy mean viral load was 27431.41 copies/ml and at 12 months mean viral load was 20548.99 copies/ml.

Change in viral load from 6 months to baseline was 306393.59 (P value 0.048) and change in viral load from 12 months to baseline was 313276.01 (P value 0.045).

The mean viral load is found to be decreased from baseline to successive follow-ups.

Viral load decreased statistically significant (P value <0.05) at 6 and 12 months from baseline in the present study.

Virological failure on ART can be due to a number of factors, including baseline drug resistance among patients prior to starting treatment [7], the evolution of drug resistance during treatment, duration of time on treatment and poor adherence to medication.

Clinical studies of ART in experienced patients had previously demonstrated that baseline plasma HIV-1 RNA level was highly predictive of virologic response. [8]

Dishank Patel et al [9] in his study observed a viral suppression of < 400 copies/ml plasma viral load in 103 (82%) patients which is statistically significant (P < 0.0001).

A meta-analysis is done by Olawalea A, [10] to study the summarize reported rates and reasons for virological failure among people on second-line therapy in resource-limited settings. [11] It was found that, seven studies reported virological failure at 6 months, with proportions ranging from 8.59 to 37.34% [6]

Virological failure at 12 months was reported by seven studies and ranged from 11.35 to 39.89%72

In study by Murphy R [6] virological failure rate in first 24 months of second-line therapy was low (at 6 months-26%; at 12 months- 25%; at 18 months- 21%; and at 24 months- 25%).

Conclusion

Second line ART was found to achieve statistically significant (P value <0.05) clinical effectiveness (weight increase), virological effectiveness (viral load decrease), immunological effectiveness (CD4 count increase) at 6 and 12 months from baseline.

References

1. Federal Ministry of Health (FMOH) Ethiopia Ethiopian national comprehensive HIV care guideline 2018.pdf. 2018.
2. Stephanie Watson and Carmelita Swiner. The History of HIV Treatment: Antiretroviral Therapy and More. August 03, 2022.
3. Cheney L, Barbaro JM, Berman JW. Antiretroviral Drugs Impact Autophagy with Toxic Outcomes. *Cells*. 2021; 10(4):909.
4. Zhao Y, Mu W, Harwell J, Zhou H, Sun X, Cheng Y, et al. Drug resistance profiles among HIV-1-infected children experiencing delayed switch and 12-month efficacy after using second-line antiretroviral therapy: an observational cohort study in rural China. J Acquir Immune Defic Syndr 2011; 58:47–53.
5. Win, M. M., Maek-A-Nantawat, W., Phonrat, B., Kiertiburanakul, S., & Sungkanuparph, S. Virologic and immunologic outcomes of the second-line regimens of antiretroviral therapy among HIV-infected patients in Thailand. Journal of the International Association of Physicians in AIDS Care 2011; (Chicago, Ill.: 2002), 10(1), 57–63.
6. Murphy RA, Sunpath H, Castilla C, Ebrahim S, Court R, Nguyen H, Kuritzkes D, Marconi VC, Nachega JB. Second-line antiretroviral therapy: long-term outcomes in South Africa. J Acquir Immune Defic Syndr. 2012 Oct 1;61(2):158-163.
7. Tripathi A, Youmans E, Gibson JJ, et al. The impact of retention in early HIV medical care on viro-immunological parameters and survival: a statewide study. AIDS Res Hum Retroviruses. 2011; 27:751–758.
8. Yehia BR, French B, Fleishman JA, et al. Retention in care is more strongly associated with viral suppression in HIV-infected patients with lower versus higher CD4. J Acquir Immune Defic

Syndr. 2014; 65:333–339
9. Marks G, Patel U, Stirratt MJ, Mugavero MJ, Mathews WC, Giordano TP, Crepaz N, Gardner LI, Grossman C, Davila J, Sullivan M, Rose CE, O'Daniels C, Rodriguez A, Wawrzyniak AJ, Golden MR, Dhanireddy S, Ellison J, Drainoni ML, Metsch LR, Cachay ER. Single Viral Load Measurements Overestimate Stable Viral Suppression Among HIV Patients in Care: Clinical and Public Health Implications. J Acquir Immune Defic Syndr. 2016 Oct 1;73(2):205-12
10. Ajose O, Mookerjee S, Mills EJ, Boulle A, Ford N. Treatment outcomes of patients on second-line antiretroviral therapy in resource-limited settings: a systematic review and meta-analysis. AIDS. 2012 May 15;26(8):929-38.
11. Berdi F., Abderrahim B., Jihane I., Yassine A., Hicham E., Kamal D., & Yassir B. Les interactions médicamenteuses chez des patients sous chimiothérapie: Étude réalisée au service d'hématologie clinique de HMIMV-RABAT. Journal of Medical Research and Health Sciences, 2023; 6(4): 2519–2526. Retrieved from http://jmrhs.info/index.php/jmrhs/article/view/686.