ORIGINAL ARTICLE

Title; Efficacy of antiviral treatment on HIV $^{+}$ patients and CD4 $^{+}$ Tcell

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Abstract

Background: Acquired immunodeficiency syndrome is an important infectious disease in contamination of committed T cells. There is a global widespread infection of HIV .The end stage of HIV infection is one of the most causes of death across the world. HIV transmission can be introduced by infecting $CD4^{+}$ cells.

Objective: For understanding the progression of virus and usefulness of treatment, we measured the number of $CD4^{+}$ cells change.

Materials and Methods: We monitored the count of $CD4^{+}$ cells by Flowcytometry before and during treatment of HIV infected people by Ziduvudine 100 mg twice a day, Lamivudine 150 mg twice a day and Nevirapin 200 mg a day, retrospectively.

Results: The study population included 195 HIV positive patients, 87.1% men and 12.8% women. Most of infected patients were older than 40 years old (29.2%). CD4 counts of 20 patients were less than 350 and received treatment. Patients with CD4 count less than 350 withdrew antiviral therapy. At first stage of treatment, patients with CD4 count less than 100 were 58.3% of infected patients but after treatment with antiviral drugs for six months it decreased to 33%. CD4 count of 25% of these people changed to more than 350 while before cure we did not have CD4 count more than 350 among these patients.

Conclusion: After six months treatment, 25% of patients CD4 count reached to more than 350 and showed that at early stage of AIDS we can control the disease and therapy can have beneficial effects in some patients.

Key words: *HIV,Ziduvudine,Lamivudine ,Nevirapin, CD4 count*

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Introduction

For the last decades, there has been a universal spread of human immunodeficiency virus (HIV).The result of HIV infection is one of the most reason of death across the world. Acquired immunodeficiency syndrome (AIDS) progression is different among infected patients. Studies showed that some patients resistant to virus which depends on type of virus and host features. Different methods are existing for treatment and prevention(1-4). Self-administering prophylactic materials such as microbiocides limit the transmission of HIV and sexual transmitted diseases. HIV transmission can be defined by virus crossing the epithelial surface and infecting $CD4^+$ cells. The entry of HIV into $CD4^+$ cells is mediated by different glycoproteins which exist on the viral envelope(5-13). So the number of $CD4^+$ cells during treatment will be affected by drugs and virus but it is unclear. To find out the progression of HIV and utility of therapy, the number of $CD4^+$ cells change is necessary. The purpose of this study was evaluation of HIV positive patients' condition before and after treatment of HIV infection by antiviral drugs.

Method and Material

-Ethical Approval

This study was approved by the Ethics Committee of the Mazandaran University of Medical Sciences, Sari, IRAN.

-Patients and Samples

In this retrospective study ,we examined patients with HIV newly diagnosed who were referred to infectious diseases researches center in sari Tooba clinic and ghemshar Razi hospital (Mazandaran province of IRAN) for diagnosis and treatment. Patients with $CD4^+$ count less than 350 had been considered for receiving antiviral treatment with Ziduvudine 100 mg twice a day,Lamivudine 150 mg twice a day and Nevirapin 200 mg a day. We took 5 ml of peripheral whole blood of the patients. Then, we isolated peripheral blood mononuclear cells with Ficoll histipaque 1.077(sigma, USA).

-Flow cytometry

Mononuclear cells were stained with FITC-anti-CD4 or isotype control antibodies (DAkO, Germany) for 30 min at 4°C. Surface expressions of the antigens were measured by Flowcytometry (patec pas, Germany).

-Statistical Analysis

The procedures included were transcription, preliminary data inspection, content analysis and finally interpretation. Statistical analysis was performed with SPSS software (version 16, Chicago, IL, USA).

Results

The study population included 195 HIV positive patients that 87.1% (170 patients) of those were men and 12.8% (25 patients) women. 29.2% of infected patients were older than 40 years old (Table 1). Twenty patients with CD4 count less than 350/µl needed to receive drugs but 12 patients were

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screened and other 8 patients ruled out since they did not return to center for treatment. The features of these twenty patients have been showed at table 2. At the beginning of treatment of these twenty patients, individuals with CD4 count less than 100 were 58.3% (7 patients) of study population but after six months treatment with antiviral prescriptions, it switched to 33%(4 patients). For patients whom CD4 count was among 100-200, the count was 16.6% (2 patients) and improved to 25% (3 patients). At the onset, there were no patients with CD4 count more than 350, whereas after these regimens, CD4 count of 25% (3 patients) changed to more than 350 (Table3).

Table 1.Charactristic of study population in the Mazandaran province of Iran

Gender	**Female**	**25(12.8%)**
	Male	**170(87.1%)**
Age (years)	**≤25**	**2(1%)**
	25-30	**11(5.6%)**
	31-35	**30(15.3%)**
	36-40	**32(16.4%)**
	>40	**57(29.2%)**
	Missing	**63(32.3%)**
Marital States	**Currently Married**	**57(29.2%)**
	Got divorced	**22(11.2%)**
	Single	**31(15.8%)**
	Missing	**85(43.5%)**

Table 2.Charactristic of patients with CD4 Count less than 350

Addiction	**Not addicted**	**9(45%)**
	Addicted	**11(55%)**
Among the addicted patients	**IV drug abuser**	**3(15%)**
	Methadone	**4(20%)**
Respiratory tract infection	**Pneumonia**	**9(45%)**
	TB	**2(10%)**

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Table 3.Number of CD4 Count before and after six months administration of Ziduvudine,Lamivudine and Nevirapin in patients with CD4 Count less than 350

CD4 Count before treatment	**>350 cell/µl**	**0(0%)**
	201-350 cell/ µl	**3(25%)**
	100-200 cell/ µl	**2(16.6%)**
	<100 cell/ µl	**7(58.3%)**
CD4 Count after treatment	**>350 cell/ µl**	**3(25%)**
	201-350 cell/ µl	**2(16.6%)**
	100-200 cell/ µl	**3(25%)**
	<100 cell/ µl	**4(33.3%)**

Discussion

In this study, we compared the percentage of $CD4^+$ cells in HIV positive patients before and during treatment to elucidate antiretroviral regimens efficacy in progression of disease. The patients with low $CD4^+$ cells are high risk for peripheral neuropathy, lactic acidosis and lipoatrophy and other metabolic complications (14-20). TB is an important world health concerning problem that will affect the industrialized nations more. The main cause is aside from TB/HIV co-infection, is the increase of resistant TB strains. The condition is serious since of the spread of multidrug-resistant TB (21). In this study, we observed 55% of the patients had respiratory disorders including 10% TB infection and 45% pneumonia.

At the present study, patients with CD4 count less than 350 underwent antiviral therapy with Ziduvudine 100 mg twice a day, Lamivudine 150 mg twice a day and Nevirapin 200 mg a day. Our findings revealed that among the patients who got therapy for six months, CD4 count of 3 patients (25%) changed to more than 350. Although our results were significantly different before and after treatment, but the question is why we cannot control all patients and cure them forever. In spite of this therapy, after several months, CD4 count of some patients came down and they died. Primary outcomes were useful but we showed that some patients had drug resistance. So, in future, we may need to change the drugs doses. There were several limitations which not resolved by this study, although these regimens seemed to be beneficial but we did not monitor other drugs effect such as co-trimoxazole to

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realize that they have positive or negative effect on immune system. Moreover, we can't eliminate these drugs because they inhibit other infections in these patients and if we exclude them it seems to get converse effect. So, further investigations may be required to be done to classify different drugs doses at various stages of disease on more patients.

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