



## PREVALENCE OF HYPOTHYROIDISM AMONG HIV PATIENTS IN A RURAL TERTIARY CARE CENTRE OF SOUTH INDIA

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### ABSTRACT

**Background:** This study was conducted in the department of Medicine, in a rural tertiary care centre of South India to detect the prevalence of hypothyroidism in HIV patients and also to assess its association with duration of antiretroviral therapy (ART) and CD4 levels. **Methods:** 150 patients attending a rural tertiary care hospital in South India who satisfied the inclusion criteria were taken as study subjects. Detailed history was taken and physical examination and necessary lab investigations were done as per a structured proforma. **Results:** The estimated prevalence of hypothyroidism is 5.3% and out of this 63.3% cases were with subclinical hypothyroidism. There was no correlation between gender and occurrence of hypothyroidism. There was a positive correlation between prevalence of hypothyroidism among HIV patients and low CD4 counts. There was no correlation between duration of ART and prevalence of hypothyroidism among HIV patients. **Conclusion:** Hypothyroidism is frequent in HIV patients. The observed prevalence of hypothyroidism in this study is less than that of North Indian studies and similar to Western studies. Subclinical hypothyroidism is the predominant hypothyroid condition observed in HIV patients. In this study, there was no significant correlation between gender and occurrence of hypothyroidism. Low CD4 count of value <200 has positive correlation with hypothyroidism. All individuals with CD4 count <200 should be screened for hypothyroidism. No correlation was established between duration of ART and hypothyroidism.

**KEYWORDS:** HIV, Hypothyroidism, Subclinical hypothyroidism, CD4 Count, ART.

### INTRODUCTION

Endocrine changes occur in Human immunodeficiency virus infection, both in the early and late stages. This may be due to a direct effect of HIV or it may be due to secondary endocrine dysfunction due to the indirect effects of cytokines, opportunistic infections or infiltration by neoplasm. Manifestations can vary from subtle biochemical and hormonal changes to overt glandular failure. Although the prevalence of overt thyroid disease does not appear to be significantly increased in HIV-infected patients, compared with the general population, specific patterns of abnormal thyroid function test findings are more frequently identified among HIV-infected patients.

Among patients with advanced acquired immunodeficiency syndrome, nonthyroidal illness namely euthyroid sick syndrome is common. During antiretroviral therapy, the prevalence of two generally asymptomatic conditions (subclinical hypothyroidism, which is characterized by isolated elevated thyroid-stimulating hormone levels, and isolated low free thyroxine levels) is increased. In addition, Graves' disease, which is marked by low thyroid-stimulating

hormone and elevated thyroxine levels, may occur during immune reconstitution. Testing for thyroid disease among symptomatic patients should begin with measurement of the thyroid-stimulating hormone level. However, there is insufficient evidence to recommend routine thyroid screening of asymptomatic HIV-infected individuals.

This study was conducted in the department of Medicine in a rural tertiary care centre in South India in association with the ART clinic, to detect the prevalence of hypothyroidism in HIV patients and also to assess the association with duration of ART and CD4 levels.

### MATERIALS AND METHODS

It is a cross sectional study conducted in ART Centre in a rural tertiary care centre in South India, for a period of one year from date of ethical clearance .150 HIV patients attending the ART centre were the subjects. A detailed history relevant to study was taken including age at the time of diagnosis of HIV, duration of disease, on ART or not ,if on ART, duration and specific type of ART, latest CD4counts and history of thyroid illness

prior to the diagnosis of HIV. The investigations done include CBC, FT4, TSH and CD 4 Count.

The data was collected from patients who satisfied the inclusion criteria. HIV infection was confirmed as per the National AIDS Control Organization (NACO) recommendations. Written consent was obtained from all patients who participated in the study. Patients of age 18 years or above who were clinically stable were included in the study.

The prevalence was analysed by using SPSS version 16. All numerical variables were compared using independent samples t test or ANOVA. Categorical variables were compared using Chi<sup>2</sup> test. Associations between numerical variables were computed using Pearson's  $\chi^2$  correlation coefficient.

## RESULTS

The observation was made in 150 HIV patients who fulfilled the inclusion criteria. Out of the 150 individuals, 86 (57%) are males and 64 (43%) are females. Study sample was divided into four age groups. 3(2%) were under 20 years, 51(34%) were between 20-40 years, 92(61%) were between 40-60 years and 4(3%) were above 60 years of age. The mean age of study sample was 43.26.

Patients were also categorized into two groups based on CD4 count. 84(56%) were having CD4 count more than 200 and 66 (44%) were having CD4 count less than 200. The mean CD4 count of the study sample was 197.3.

This study also categorized patients based on their duration of ART. 136 (90.67%) were having duration of therapy less than 10 years and 14(9.33%) were having greater than 10 years.

In this study, we tested TSH and FT4 to detect hypothyroidism among these 150 individuals. On analyzing the thyroid function profiles, the observed mean TSH value was 2.99 and our reference normal TSH value was 0.35-5.0. The observed mean FT4 value was 0.93 and our reference FT4 value was 0.7 – 1.48.

As per the results, the estimated prevalence of hypothyroidism was 5.33% (8 patients out of 150). The number of patients with overt hypothyroidism was 3 (2%), with subclinical hypothyroidism was 5(4%) and with low FT4 is 1(0.7%). On comparison with two reference studies done in North India, where prevalence of hypothyroidism was as high as 40.66% and 24% [117, 55], our study showed a low prevalence of 5.33%.

## DISCUSSION

In this study, among the detected cases of hypothyroidism 8 out of 150, 5 were having subclinical

hypothyroidism and only 3 were having overt hypothyroidism. Thus, there is high prevalence of subclinical hypothyroidism than overt hypothyroidism among HIV patients in our study. This is actually commonly observed trend in all other studies.

We also analyzed hypothyroid patients and their correlation with gender, CD4 count and duration of ART.

Among the patients detected with hypothyroidism, 6 (75%) were males and 2 (25%) were females. But on statistical analysis there was no significant correlation between male gender and occurrence of hypothyroidism. The obtained P value is 0.467.

Among the patients detected with hypothyroidism, 7 (88%) were having low CD4 count of value less than 200 and 1 (12%) were having CD4 count of value greater than 200. On statistical analysis there was a significant correlation between low CD4 count and occurrence of hypothyroidism. The obtained P value was 0.014. Low CD4 count was a risk factor for hypothyroidism in studies conducted by Beltran *et al.*<sup>[1]</sup>, Collazos *et al.*<sup>[2]</sup> and Brockmeyer<sup>[3]</sup>

On analysis of duration of ART in patients with hypothyroidism, none of the patients were on ART for more than 10 years. So, in this study, there was no correlation between hypothyroidism and long duration of ART. The obtained P value is 1.00. But few other studies had positively correlated these variables. Probably selection of only a few patients (14 out of 150) with a long duration of ART in this study may be the cause this observation.

## CONCLUSION

This study was conducted to detect the prevalence of hypothyroidism in HIV patients and also to assess its association with the duration of ART and CD4 count. 150 patients were included in the study. The findings obtained in this study are as follows.

Hypothyroidism is frequent in HIV patients. The observed prevalence of hypothyroidism in this study is less than that of North Indian studies and similar to Western studies. Subclinical hypothyroidism is the predominant hypothyroid condition observed in HIV patients. There was no significant correlation between gender and occurrence of hypothyroidism. Low CD4 count of value <200 has positive correlation with hypothyroidism. All individuals with CD4 count <200 should be screened for hypothyroidism. No correlation was established between duration of ART and hypothyroidism. The limitation of the study is that it involves only a few patients with long duration of ART.

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