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Original Research Article

Thyroid profile in newly diagnosed male HIV patients: a study from North Western part of India

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ABSTRACT

Background: The aim of this study was to determine proportion of newly diagnosed male HIV cases with thyroid dysfunction at different levels of CD4 counts.
Methods: 195 newly diagnosed male HIV patients attending medical OPD, ART centre and medical wards of SMS Medical College and Hospital, during a period of May 2012 to April 2013 were enrolled in the study. These patients were divided in three groups on the basis of CD4 cell counts. Group A: CD4 counts <200/mm^3, Group B: CD4 counts 200-499/mm^3 and Group C: CD4 counts >500/mm^3.
Results: We concluded a negative correlation between the CD4 counts and serum TSH level (r = -0.382) which was significant (p-value <0.05). Overall 32 (16.41%) patients had increased TSH, 4 (2.05%) patients had decreased and 159 (81.53%) patients had normal TSH level. Plasma TSH values in group A were higher than group B and C and they were highly significant (p<.001). Mean plasma TSH values in patients of group A, B and C was 4.56±3.60 µIU/mL (range: 1.10-17.74), 2.20±1.02 µIU/mL (range:0.24-4.22) and 2.23±1.06 µIU/mL (range:0.28-4.25) respectively. (Reference normal value = 0.4-4.0 µIU/mL). There was significantly positive correlation (p-value < 0.01) found between the CD4 counts and serum free T4 levels (r = +0.378).
Conclusions: This study has demonstrated a high prevalence of thyroid dysfunction in HIV infected patients of this part of country. High prevalence of thyroid dysfunction may contribute to the morbidity of the patients and have a bearing on quality of life of the HIV infected patients. Severity of hypothyroidism was correlated with decreasing CD4 cell count.

Keywords: CD4 cell count, Endocrine changes, Hyperthyroidism, Hypothyroidism

INTRODUCTION

Human immunodeficiency virus (HIV) is known to be associated with multiple endocrinopathies.[1] Thyroid dysfunction is more common in HIV patients than the general population.[2] Thyroid gland dysfunction may be due to the systemic effects of HIV, opportunistic infections, infiltration by a neoplasm or and as a complication of treatment.[3] Altered production of thyroid hormones often involves dysfunction of thyroid gland, pituitary gland, and hypothalamus.[4]

There is a paucity of data from Indian subcontinent in context of thyroid dysfunction in HIV patients. Hence this cross-sectional study was done to evaluate the thyroid functions in HIV infected patients.

The objectives of this study was to determine proportion of newly diagnosed HIV cases with thyroid gland dysfunction and to evaluate the thyroid function at different levels of CD4 count in newly diagnosed HIV infected person.

METHODS

Present study was conducted in Department of Medicine S.M.S. Medical College, Jaipur on newly diagnosed 195 male HIV positive patients attending medical OPD, ART clinic or admitted in medical wards. Patients were divided into three groups with 65 patients in each group on the basis of CD4 cell count.

- Group A: HIV positive with CD4 cell counts <200/mm^3
- Group B: HIV positive with CD4 cell counts 200-499/mm^3
- Group C: HIV positive with CD4 cell counts >500/mm^3.

Patients with previously known endocrine disorder were excluded from the study. Study was approved by the ethical committee of S.M.S. Medical College. All patients gave written informed consent before participating in the study.

Detailed clinical, systemic and anthropometric evaluation was done besides relevant laboratory investigations. Serum was collected from the patients for the estimation of serum FT3, FT4 and TSH levels. Measurement of these hormones was done by immulite 2000 (Chemiluminescent reaction) as per protocol of immulite 2000 kits supplied by Siemens, Siemens Medical Solutions Diagnostic Ltd. UK.

RESULTS

Mean plasma level of TSH in patients of group A, B and C was 4.56±3.60 µIU/mL (range: 1.10-17.74), 2.20±1.02 µIU/mL (range: 0.24-4.22) and 2.23±1.06 µIU/mL (range: 0.28-4.25) respectively (Reference normal value = 0.4-4.0 µIU/mL).

Plasma TSH value in group A was significantly higher than group B and C (p<.001). The level of plasma TSH in group B was slightly lower than group C and did not have any significant difference (p>0.05) (Figure 1).

Table 1: Mean hormone levels in different CD4 cell groups.

Hormone (Mean±SD)	Group A (CD4 count <200)	Group B	Group C	Reference range
TSH (µIU/ml)	4.56±3.60	2.20±1.02	2.23±1.06	0.4-4.0 µiu/ml
FT4 (ng/dl)	1.00±0.31	1.37±0.34	1.37±0.34	0.89-1.76 ng/dl
FT3 (pg/ml)	2.66±0.87	2.81±0.65	2.80±0.70	1.8-4.2 pg/ml

There was negative correlation between the CD4 counts and serum TSH level (r=-0.382) which was statistically significant (p-value < 0.05). Overall 32 (16.41%) patients had increased TSH, 4 (2.05%) patients had decreased and 159 (81.53%) patients had normal TSH level.

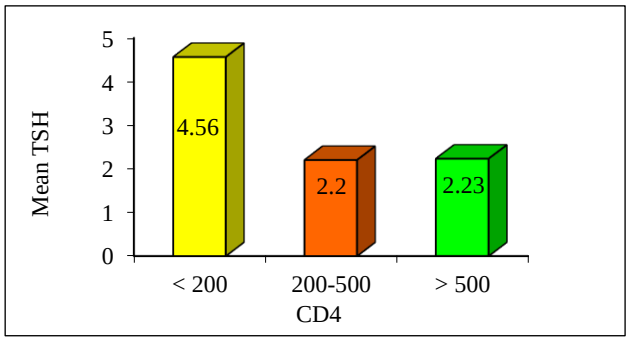

Figure 1: Mean TSH according to CD4 cell groups.

Mean plasma Free T4 value in patients of group A, B and C was 1.00±0.31 ng/dL (range:0.41-2.16), 1.37±0.34 ng/dL (range:0.67-2.49) and 1.37±0.34 ng/dL (range:0.68-2.52) respectively. Mean plasma Free T4 value of group A was lower than group B and C (p>0.05) and of group B was equal to group C (p>0.05) with no statistically significant difference. There was a positive correlation between the CD4 counts and serum Free T4 level (r=+0.378) which was significant (p-value < 0.01) (Table 1).

Mean plasma free T3 value in patient of group A, B and C was 2.66±0.87pg/mL (range:0.98-4.17), 2.81±0.65 pg/mL (range:1.44-4.21) and 2.80±0.70 pg/mL (range:1.52-4.25) respectively. Plasma Free T3 value in group A was lower than group B and C, but was not significant (p>0.05). Similarly, plasma Free T3 value in group B was higher than group C but with no significance (p>0.05). There was also a non-significant (p-value >0.05) positive correlation between the CD4 counts and serum FreeT3 levels (-0.494) (Table 2).

Table 2: Correlation of Thyroid Profile with CD4 cell count.

Correlation	r-value	p-value	Significance
CD4 versus TSH	-0.382	< 0.05	Sig.
CD4 versus FT4	+0.378	< 0.01	Sig.
CD4 versus FT3	+0.077	> 0.05	NS.

Overall in the 195 patients studied, 30 (15.38%) patients had decreased, 27 (13.84%) patients had increased and 138 (70.76%) patients had normal FT4 value. Similarly, in these 195 patients 27 (13.85%) patients had decreased,

2 (1.02%) patients had increased and 166(85.12%) patients had normal FT3 value.

DISCUSSION

Many alterations in endocrine function have been reported in association with HIV infection and AIDS. Among adult people in India, the overall prevalence of hypothyroidism is 3.9% and the prevalence of subclinical hypothyroidism is 9.4% according to a population based study in India.[5] Study conducted a cross sectional study to evaluate the thyroid dysfunction in newly diagnosed male HIV infected patients. The causes of thyroid dysfunction were not determined in our study.

In this study 32 (16.41%) patients had hypothyroidism of which 5 (2.56%) patients were overt hypothyroid and 27 (13.84%) patients were of subclinical hypothyroidism (TSH = 4-10 µIU/mL). All overt hypothyroid patients were from group A. 4 (2.05%) patients from the study population had decreased TSH levels.

These results are comparative to the study of Meena et al, in which they concluded abnormal thyroid function in 40.66% (30% subclinical hypothyroidism, 10.66% primary hypothyroidism.[6] High incidence of biochemical hypothyroidism 10/25 (40%) has also been reported by Jain et al in patients with CD 4 <200.[7] This observation is also similar to the study by Ketsamathi C et al, who found abnormal thyroid function test in 16%.[8]

The high incidence of hypothyroidism in the present study with HIV/AIDS may have importance in management of these patients. This hypothyroidism can also be due to transient thyroiditis. However, if this data is supported by a large longitudinal study, a routine screening for thyroid function may be advocated at least in patients of HIV with advanced immunosuppression.

There was a significant negative correlation of the CD4 counts with serum TSH levels (r=-0.382) with a p-value < 0.05. There was a significant positive correlation (p-value < 0.01) between the CD4 counts and serum free T4 level (r= +0.378) and non-significant positive correlation (p-value >0.05) between CD4 counts and serum Free T3 level (-0.494). Meena et al, also found an increase in mean TSH value with the progression of disease and a negative correlation between the CD4 counts and serum TSH (r= -0.257, p=0.002) which was similar to the present study.[6]

In this study done by Jain et al, there was a direct correlation between CD4 count and free T3 (FT3) and free T4 (FT4) values (r = 0.357 with P < 0.05; r = 0.650 with P < 0.05, respectively).[7] An inverse correlation of CD4 counts with serum TSH levels was also noted by them (r = −0.470 with P <0.050) which was in accordance to the present study.

Thyroid dysfunction can be explained by hormonal changes as a stress response to the advanced disease state or comorbidities and as a component of immune reconstitution syndrome. Thyroid failure can also result from the destruction of the thyroid gland by opportunistic infections such as Pneumocystis carinii, or tumors. Less frequently, hypothalamic-pituitary failure due to central nervous system infections is involved.[9,10]

CONCLUSION

The present study revealed a high prevalence of thyroid dysfunction in newly diagnosed HIV patients. There are increased chances of hypothyroidism with the progression of disease, so it can be used as an indicator for disease progression.

This study had demonstrated a high prevalence of thyroid dysfunctions in HIV infected patients in this part of country. This may contribute to morbidity of the patients having a bearing on quality of life of the HIV infected patients.

A larger longitudinal study from this part of world would be required to better understand of thyroid dysfunction in HIV infected patients and also the relationship of the declining CD4 counts with this endocrinopathy.

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