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To Study the Prevalence of Thyroid Dysfunction in Newly Diagnosed HIV +ve Patients and Correlation between CD4 Count and Thyroid Dysfunction.

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ABSTRACT

Background: Thyroid dysfunction is one of the common endocrine dysfunction in HIV Positive patients. Newly Diagnosed HIV Positive patients are rarely monitored for this problem. Objective:- To study the prevalence of thyroid dysfunction in newly diagnosed HIV positive patients & to Correlate it with CD4 Count. **Methods:** A prevalence study was carried out on 150 newly diagnosed HIV Positive patients with different CD4 Counts divided in three groups (Group A; CD4<350, Group B; CD4 350-550 and Group C; CD4>550) who were evaluated for thyroid dysfunction. Blood samples were collected for CD4 T Lymphocytes. Counts were determined by flow cytometry and Thyroid function was evaluated by chemiluminescence immunoassay. **Results:** Out of 150 cases studied, 47 Patients (31.33%) had thyroid dysfunction. Group A, B and C had Thyroid dysfunction in 40 %(20), 32 %(16) and 22 %(11) patients respectively. All except one had hypothyroid state (TSH above normal range).When the results were analyzed for 150 patients with Pearson correlation coefficient. There was an inverse correlation of CD4 count and TSH. There was progressive decline in T3, T4 levels as CD4 count decreased. **Conclusion:** Thyroid dysfunction is frequent in newly diagnosed HIV positive patients and prevalence of thyroid dysfunction increased with decrease in CD4 count. TSH levels increased as CD4 count declined.

Keywords: AIDS, HIV, Thyroid.

INTRODUCTION

Abnormal thyroid function tests are common among human immunodeficiency virus (HIV)–infected patients.[1-3]Acquired immunodeficiency syndrome (AIDS) resulting from infection with human immunodeficiency virus (HIV) may directly or indirectly affect any organ system. Increasing experience with this syndrome has led to the recognition of a variety of HIV related endocrine disorder that occurs during both the early and late stages of the disease. Among these disorders a high prevalence of abnormalities in thyroid function tests is reported in previous cross-sectional studies. Unique abnormalities of thyroid function tests were reported by Lambert M et al.[4]

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Subtle alterations in thyroid function tests (TFT) are more common in HIV infection and are sometimes already detectable in the early phase of disease. The changes in thyroid function tests are HIV specific and are consistent with an abnormal response to acute illness. Various mechanisms have been proposed to explain such abnormalities in TFT. These include direct infection of the thyroid gland by opportunistic organisms such as Pneumocystis carinii, infiltration of the gland by tumors such as Kaposi sarcoma, effect of humoral factors such as IL-1β and TNF-α, side effect of the drugs used in the course of HIV infection for e.g. rifampicin, ketoconazole, steroids etc. and direct infection of the gland by HIV.[5,6] However, there is insufficient evidence to recommend routine thyroid screening of asymptomatic HIV-infected individuals. Hence this study was undertaken, to evaluate the prevalence of thyroid abnormalities in this subset of newly diagnosed HIV positive patients.

Objectives

To study the prevalence of the thyroid dysfunction among newly diagnosed HIV +ve patients and

correlation if any between CD4 cell count and thyroid dysfunction in newly diagnosed HIV +ve patient.

MATERIALS AND METHODS

The present study was carried out at ART Centre, Rajindra Hospital Patiala from 2011-13. 150 newly diagnosed HIV reactive patients as per NACO guidelines, who were not receiving any anti-retroviral therapy at the time of enrollment were included. All the included cases were interviewed and thoroughly examined. Informed consent was obtained from all subjects. The study was approved by academic Ethics committee of the institution.

Inclusion Criteria

- Subjects having HIV serology positive by three Kits (MICRO-ELISA, Comb-AIDS RS and HIV Tridot antigen tests) were only included as per ICTC protocol.

Exclusion Criteria

- Patients with inter-current illnesses like Pneumonia, Influenza or Herpes Simplex or seriously ill patients.
- History s/o Thyroid illness, clinically evident thyroid enlargement or thyroid disease or already diagnosed case of thyroid diseases.
- Use of drugs known to interference with thyroid hormone metabolisms for e.g. Steroid, Antiepileptic etc.
- Abnormal liver functions tests i.e. SGOT, SGPT greater than three times upper limit.
- Abnormal renal functions test i.e. serum creatinine levels greater than 1.6 mg%

Cases were divided in three groups of 50 patients each for study purpose.

Group A – HIV positive with CD4 count < 350/ mm3

Group B- HIV positive > 350 – 550 cells/mm3

Group C – HIV positive> 550/ mm3

Total T3, T4, TSH status was checked by Chemiluminescence Immunoassay (CLIA) CD4 count was determined by Flow cytometry by FACS count system (Beckton Dickinson).

Statistical Analysis

The observations were tabulated and data subjected to statistical analysis. Karl Pearson's correlation coefficient method and one-way ANOVAs was used for statistical analysis of data.

RESULTS

Table 1: Characteristics of Patients in Different Groups.

	Group A	Group B	Group C
Age	35.84 ± 12.36	35.46 ± 10.69	37.28 ± 10.30
CD4 Count (cells/mm^3)	<350	350-550	>550
range	(26-324)	(353-548)	(556-1552)
Mean T3 (ug/ml)	0.93 ± 0.54	1.16 ± 0.39	1.31 ± 0.34
Range	(012 – 2.40)	(0.24 – 1.80)	(0.30 – 1.90)
MeanT4 (ug/dl)	6.68 ± 2.69	7.54 ± 1.86	8.17 ± 1.59
Range	(1.30 – 10.40)	(4.10 – 10.30)	(3.90 – 10.70)
MeanTSH (mIU/l)	8.65 ± 25.39	4.53 ± 2.93	3.82 ± 2.74
Range	(0.17 – 181.53)	(0.83 – 10.30)	(0.79 – 11.78)
Thyroid Dysfunction (No. of patients)	20 (40%)	16 (32%)	11 (22%)

Table 2: Prevalence of Thyroid Dysfunction in Different Groups.

	Group A	Group B	Group C
Total No. of newly diagnosed HIV + ve patients with Thyroid Dysfunction	20 (40%)	16(32%)	11(22%)
Subclinical Hypothyroidism	2	7	8
Overt Hypothyroidism	12	3	1
Others			
Isolated T3	5	6	2
Isolated T3	1	0	0

Table 3: Correlation between CD4 and Thyroid Dysfunction.

	Group A	Group B	Group c
Pearson's Correlation Coefficient (r)	-0.361	-0.482	-0.325
Significance	0.01	0.0003	0.02

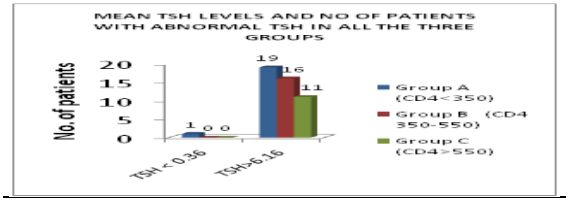

Figure 1: Mean TSH levels.

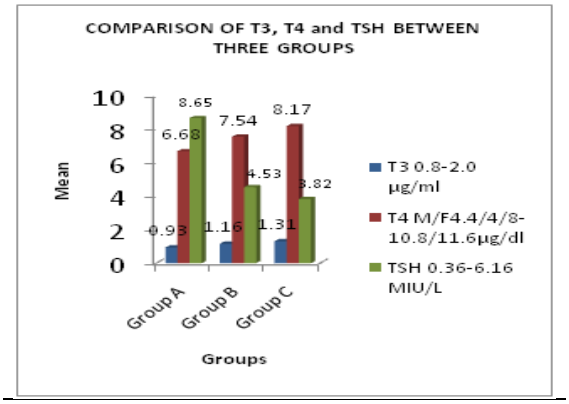

Figure 2: Comparison of T3, T4 and TSH between three groups.

Mean Age in group A, B and C was 35.84 ±12.36 yrs, 35.46 ±10.69 yrs. and 37.28 ± 10.30 yrs. Mean CD count in group A,B and C were 175.28 ±67.54 cell /mm^3, 425.86 ± 54.49 cell / mm^3 and 708.20 ± 202.59 cells/mm^3. There was no correlation between CD4 count and Age. The means T3 levels in group A B and C were 0.93± 0.54, 1.16± 0.39 and 1.31±0.34 ug/ml respectively while mean T4 levels in group A , B and C were 6.68± 2.69, 7.54±1.86 and 8.17±1.59 ug/dl respective while TSH in group A, B and C were 8.65±25.39, 4.53±2.93 and 3.82±2.74 mIU/l. [Table 1] In Group A 20 patients (40%) had abnormal thyroid function one had TSH (<0.36 while 19 had TSH >6.16). In Group B 16 (32%) patients had TSH>6.16 while in group C 11 (22%) patients had TSH >6.16 [Figure 1]. The prevalence of thyroid dysfunction in all three groups was highly significant. There was progressive fall in mean T3 and T4 levels with decline in CD4 Count. The result was statistically analyzed for all 150 patients enrolled in our study using Pearson correlation coefficient. We found that there was direct correlation between CD4 count decline and T3, T4 decline. Prevalence of overt hypothyroidism increased as the CD4 count decreased progressively while sub clinical hypothyroidism decreased with decline in the CD 4 count [Table 2]. There was inverse correlation of CD4 count with TSH value (r = -0.361,-0.482,-.0325 & their respective P values of 0.01, 0.0003 and 0.02 were highly significant [Table 3].

DISCUSSION

Jain et al[7] studied TFT in 50 newly diagnosed HIV +VE patients 25 each with and without AIDS. They found that among 25 HIV + patients who were not having AIDS, 3 (12%) patients had FT-3 levels below the normal range, 1 (4%) patient had FT-4 level below the normal range and 1 (4%) patient had FT-4 level above the normal range. Two (8%) patients had serum TSH levels above the normal range. Serum TSH was decreased in one (4%) patient while in other 25 patients having AIDS, FT-3 levels were below the normal in 6 (24%) patients, FT-4 levels were below the normal in 9 (36%) patients and S.TSH levels were above normal in 10 (40%) patients. Similarly in a study by Meena LP et[8] al 40.66% patients showed abnormal thyroid function (30% subclinical hypothyroidism, 10.66% primary hypothyroidism), However all patients were asymptomatic. None of the patients showed any evidence of biochemical or clinical features of hyperthyroidism. In patients with CD4 < 200, 26/50(52%) had elevated TSH. Similar findings have been reported by Sujit KumarTripathy et al[9], Noureldeen et al[10], Dev N et al[11] , Joshi B et al[12], Shujing li et al[13] and Mala V Kaneria et al[14]. Our results coincide with most of the above studies.

Hypothyroidism is negatively correlated with CD4 cell counts (r2 =- 0.05 94). This finding is similar to relation of thyroid hormone abnormality in Spanish cohort (multivariate modeling)[15], suggested screening for Hypothyroidism among his infected patient with decreased CD4 cell count.

What should be the management protocols for the various abnormalities reported? Overt Hypothyroidism should be treated with levothyroxine keeping in mind that drug interactions between levothyroxine and protease inhibitors have been reported, perhaps through the shared metabolic pathway of glucuronidation.[16]Thyroid medications may also affect the course of the various comorbidities in HIV infected subjects.

Subclinical Hypothyroidism: The TSH level should be determined again in 1–3 months, because the levels in 30% of HIV-uninfected patients normalize within 1 year However, the proportion of HIV-infected patients whose levels normalize is not known. Besides, during recovery from illness, the TSH level may temporarily overshoot the normal range, which may mimic subclinical hypothyroidism.[17] No guidelines are available for the level of TSH that warrants the administration of therapy in this situation.

CONCLUSION

To conclude abnormal TFT's are encountered often in newly diagnosed HIV positive individuals. Management guidelines exist for overt dysfunction. However, larger studies are needed to evaluate the prevalence of thyroid dysfunction in newly diagnosed HIV infected patients and to formulate screening and treatment guidelines.

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