IOSR Journal of Biotechnology and Biochemistry (IOSR-JBB)
ISSN: 2455-264X, Volume 5, Issue 5 (Sep. – Oct. 2019), PP 39-41
www.iosrjournals.org

Prevalence of Auto-Immune Thyroid Disease and Anti-Tpo Antibodies in Patients Visiting Out-Patient Ward for Routine Health Checkup.

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Abstract: *The objective of the present study was to investigate prevalence of Auto-Immune Thyroid Disease (AITD) and screening for anti-thyroid peroxide auto antibodies (anti-TPO) in subjects visiting out-patient ward of Department of Medicine (Princess Esra Hospital, Hyderabad). A total of 136 cases were included consecutively. Age and gender of the patients were recorded and serum was tested for Thyroid Profile and anti-TPO antibodies by Enzyme Linked ImmunoSorbent Assay (ELISA). The male to female ratio in 136 cases was 6.4%:93.6%. It was observed that 36 cases (26%) were found to be suffering from thyroid disease based on TSH, T3 and T4 levels of these 16 (11.7%) were hypothyroid, 7 (5%) were hyperthyroid cases. The remaining 10 (7%) cases were identified as having subclinical hypothyroidism. Of these cases 34 were found to be positive for anti-TPO auto-antibodies. The 2 negative cases were of hypothyroidism. Inordinately high proportion of females were found among AITD cases as well as among all the 136 cases selected for the study.*

Date of Submission: 16-09-2019 Date of Acceptance: 01-10-2019

I. Introduction

Auto-Immune Thyroid Diseases are considered as one of the most common organ-specific Auto-Immune Diseases. The frequently observed conditions are Hypothyroidism and Hyperthyroidism. World-wide incidence of these diseases has been reported to be about 5% with a male to female ratio of 1:4 (1, 2). Antibodies to Thyroid Peroxidase and Thyroglobulin auto-antigens are regarded as the hallmark of these clinical conditions (3). In the era when the iodized salt was not introduced, due to inadequate iodine in the nutrients, the incidence of goiter due to iodine deficiency was common. However about 2-3 decades after introduction of iodized salt the incidence of Hypothyroidism and Hyperthyroidism with an auto-immune basis has increased. Various factors have contributed to rising incidence (prevalence) of hypothyroidism and hyperthyroidism. Some of these could be availability of more than adequate iodine, female gender, pregnancy and high levels of estrogen which help in initiating the process of auto immunity (4,5). The objective of the present study was to investigate the prevalence of Hypothyroidism and Hyperthyroidism in the subjects who visited out-patient ward of the Department of Medicine (PEH, Hyd) for health check-up and are advised thyroid Profile Test.

SELECTION OF CASES AND METHODOLOGY:

Cases visiting the out-patient ward of Department of Medicine (PEH, Hyd) and who were advised to get Thyroid Profile Test done were selected for the study. Total cases of 136 were selected consecutively. Demographic details like age and sex of the cases were recorded in the pro forma.

Intravenous blood was drawn from the cases aseptically in vials without anti-coagulant. The separated serum was used for TSH levels as well as total T3 and total T4 levels. The remaining part of serum was used for detecting anti-TPO antibodies by Enzyme Linked Fluorescence Assay (ELFA). Estimation of TSH, T3 and T4 levels was done by a Third generation ELFA (Biomerieux, France, 3rd Generation). Normal values of thyroid hormones tested are given in *Table.1.* Patients with TSH levels more than the upper limit of normal range and T3/T4 levels less than the lower limits of normal range were considered as suffering from Hypothyroidism. Cases whose TSH levels were less than the lower limit of normal TSH range along with elevated T4/T3 levels were diagnosed as suffering from Hyperthyroidism.

DETECTION OF ANTI-TPO ANTIBODIES:

Screening for auto-antibodies to TPO was performed on cases who were found to be suffering from Hypothyroidism, Hyperthyroidism as well as those who were identified as belonging to subclinical Hypothyroidism group. This was done to establish auto-immune basis of the disease.

Detection of auto-antibodies was carried out in 96 well micro-plate pre coated with TPO antigen. Patient's sera diluted 1:100 were dispensed into the wells in 100 micro-liter quantity. Positive and Negative controls supplied with the kit were also added (100ul) along with standard dilutions for plotting standard curve. The rest of the steps were carried out as per the instructions of the supplier. In the final step optical densities of the standards, controls and samples were measured in a micro-plate reader at 450nm.

II. Results

Of the 136 cases selected for the study 127 (93.3%) were females while only 9 (6.6%) were males, indicating a high female to male ratio. Age distribution analysis revealed high incidence in cases belonging to the age groups 21-30 years and 31-40 years (*table. 2*). Serum TSH levels were estimated in all the 136 subjects. Based on serum TSH levels 19 cases were found to be positive for hypothyroidism while hyperthyroidism was noted in 7 cases. Subclinical hypothyroidism (TSH levels >5 to < 7) was recorded in 10 cases (*Table-3*). The cases belonging to hypothyroidism and hyperthyroidism were further confirmed by estimating total T3 and T4 levels.

All the 36 cases belonging to hypothyroid, hyperthyroid and sub clinical hypothyroidism were tested for anti-TPO antibodies and the results are depicted in table 4. It was observed that out of 19 hypothyroid cases 14 (10%) were positive for these antibodies. In cases of hyperthyroid and sub clinical hypothyroidism all were positive for anti-TPO antibodies.

III. Discussion

It was observed that overall incidence of Auto immune thyroid disease (ATID) was 26(19%) 19 belonging to hypothyroidism and 7 to hyperthyroidism. The percentage of cases positive for subclinical hypothyroidism was 10 (7%).

It is concluded that the prevalence of auto immune thyroid disease particularly hypothyroidism is increasing in the post iodization era. Similar results have also been reported by UnniKrishnan et.al. (5, 6) in a population based study in selected cities of India. They also observed that female gender was found to have significant association with hypothyroidism. The significance of this study is that it demonstrate auto-immune basis of these endocrine conditions based on detection of anti-TPO antibodies.

Table 1: This table shows the standard TSH, T3 and T4 values in normal range of human blood sera.

Investigation	Normal ranges
TSH	0.27-5.0 uIU/ml
T3	0.6-3.3 nmol/L
T4	60-120 nmol/L

Table 2: This table depicts the age of patients subjects to thyroid profile test.

Range of age	Number of patients	Percentage
11-20	25	18%
21-30	36	26%
31-40	32	23%
41-50	16	11%
51-60	12	8%
61-70	8	5%
71-80	5	3%
81-90	2	1%

Table 3: This table shows the number of cases positive for anti-TPO antibodies.

Category	Number of subjects	Anti-TPO antibody		Percentage
		positive	negative	
Total cases	36	34	2	26%
Hypothyroid	19	17	2	13%
Hyperthyroid	7	7	-	5%
Subclinical hypothyroid	10	10	-	6%

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Compliance with Ethical Standards:

1. No conflicts of interest
2. Research involves human participants only
3. Informed consent taken

Tahmeen Jameel. " Prevalence of Auto-Immune Thyroid Disease and Anti-Tpo Antibodies in Patients Visiting Out-Patient Ward for Routine Health Checkup." IOSR Journal of Biotechnology and Biochemistry (IOSR-JBB) 5.5 (2019): 39-41.