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Original Research Paper

Pathology

PREVALENCE OF THYROID AUTO-ANTIBODIES IN DERANGED THYROID PROFILE, 6-YEAR STUDY IN AN INDIAN REFERENCE LABORATORY

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ABSTRACT

Introduction: Autoimmune thyroid disorder is the most common cause of hypothyroidism seen in adults. Anti-TPO and anti-TG play a vital role in lab diagnosis of autoimmune thyroid disorder. In our present study we have tried to establish a correlation between anti-TPO & anti-TG levels with various thyroid parameters

Aims and Objectives:

- To study prevalence of Anti-thyroid antibodies, which are specific for autoimmune thyroiditis, in deranged thyroid profile across Indian population
- To study prevalence of Anti-TPO antibodies across adult population
- To establish co-relation between TSH level and Anti-TPO antibody value

Method: We did a retrospective analysis of Thyroid Profile data obtained at a referral laboratory based in Mumbai over a span of 6 years (2016-2021). Population studied belonged to the city of Mumbai metropolitan region.

The separation and quantification of T3, T4, TSH, FT3, FT4, ATG & TPO in serum was done on the Cobas e-411/e-601/e-801analysrs. Total of 3342 cases were studied in the age group of 18 years - 60years.

We compared & correlated results according to gender and age.

Results: The incidence and prevalence of ATG and TPO antibodies were more in females as compared to males. For TPO antibodies P value being 0.0013 and for ATG antibodies, P value being 0.0002

Anti-TPO level had positive correlation with ATG level. (Coefficient of correlation 0.3285) (P value-0.0001). Also Anti-TPO antibodies had positive correlation with TSH levels (Coefficient of correlation 0.2207) (P value 0.0001)

Conclusion: Anti-TPO antibodies are commonly associated with thyroid dysfunction followed by Anti-TG antibodies. They are most commonly seen in 36-45 years of age group.

KEYWORDS : Hypothyroidism, Anti-TPO, Anti-TG, TSH

INTRODUCTION: -

Thyroid peroxidase (TPO) plays vital role in synthesis of thyroid hormones. It is membrane bound protein, which is expressed in thyroid gland & helps in catalyzing thyroid hormone synthesis. Hence alteration in TPO levels result in deranged thyroid profile. In India it is estimated that roughly around 42 million people have been suffering from thyroid diseases. Globally more than 110 countries have reported various forms of thyroid disorders. Alteration in TPO is caused mainly by development of auto-antibodies against thyroid peroxidase enzyme. This results in development of autoimmune thyroid disorders (AITD). Most common entities of this spectrum include Hashimoto's thyroiditis & Grave's disease. There are multiple predisposing genetic loci identified in the pathogenesis of AITD. CTLA4, HLA & IL2RA are the most common among them. In addition to this, other factors like iodine deficiency, radioiodine treatment & cigarette smoking also contributes to development of (AITD) [1,2]

Hashimoto's disease was first reported by Dr Hakaru Hashimoto, a Japanese surgeon who was working in Berlin in 1912. [3] He described this disorder in four patients, which he called as "Struma Lymphomatosa" Thyroid gland shows picture of lymphocytic infiltration, fibrosis, parenchymal atrophy & eosinophilic changes in acinar cells. Generally, thyroid gland shows some enlargement after getting affected by Hashimoto's thyroiditis, primary reason being inability of thyroid gland to synthesize thyroid hormone. Hence there is compensatory increase in number of thyroid follicular cells which eventually results in increase in size of thyroid gland. Even though Hashimoto's disease was described in 1912, Anti-thyroglobulin was detected in 1956, which proved a new concept that diseases can be caused by auto-antibodies as well [4]. Later in 1964, antibodies to thyroid microsomal antigen were described, which were later termed as Anti-TPO antibodies. [4] By using highly purified TPO and monoclonal antibodies, in 1988 Ruf et al developed a radioimmunoassay (RIA) which was suitable for routine clinical testing for Anti-TPO antibodies. Currently CMIA & CLIA methods are widely used for laboratory diagnosis.

Grave's disease was reported by Irish Physician Dr. Robert Graves in 1835, who described this form of hyperthyroidism. In this condition the autoantibodies are of "stimulating" type, rather than "suppressing" type, which cause increase in consternation of thyroid hormones. In 1956, work done by Adams & Purves, proved that agonist anti-TSH antibodies plays a key role in pathogenesis of Grave's disease.

Autoantibodies which are commonly found in all autoimmune thyroid disorders are either directed against 1) Thyroglo bullin, 2) Thyroid-peroxidae, 3) Thyrotropin receptor (TRAB) [5] Thyroid peroxidase antibody is the most commonly found antibody followed by thyroglobulin antibody. [6] Thyroid peroxidase (TPO) is expressed at apical membrane of follicular cells, which regulates thyroid hormone synthesis.

Several studies have proven that ADCC or antibody dependent cell mediated cytotoxicity could be induced by TPO antibodies. [6,7] Thus these antibodies are directly linked with damage to thyroid parenchymal cells & thus they play vital role in chronic autoimmune thyroiditis. [8]. Prevalence of TPO antibodies was studied in many studies like National health nutrition and examination survey III which reported that over 10% of adults were either TPO antibody positive or thyroglobulin antibody positive. Prevalence of AntiTPO antibodies was more as compared to anti thyroglobulin

antibodies [9]. Pedersen et al also reported prevalence of TPO antibodies was 13.1 % in Danish population [6]. Also in a study done by Li et al, cumulative incidence of TPO antibodies was reported as 2.81% [7].

Prevalence of TPO antibodies is higher in women as compared to men. Data from Wickham survey showed that annual risk of developing hypothyroidism in anti-TPO positive woman was 2.1%. However, its prevalence in high TSH group was 18.6% & in low TSH group was 3% [10,11] Many other diseases/autoimmune conditions are also associated with presence of Anti-TPO antibodies. Pernicious anemia is the most commonly associated with presence of anti TPO antibodies [12]. Also possibility of pernicious anemia is increased in patients with autoimmune hypothyroidism [13]. Systemic lupus erythematosus (SLE) & Rheumatoid arthritis is also associated with autoimmune thyroid disease [14,15]. An association between chronic urticaria and autoimmune hypothyroidism have also been reported [16]

Study Design:-

This retrospective study was conducted over period of 6 years from 2016 to 2021. Over 3342 test results were selected in a referral laboratory in Mumbai.

The population belonged to city of Mumbai (Mumbai region)

Investigations:-

1. T3, T4, TSH, free T3, freeT4
2. Thyroid antibodies: - ATG & TPO

We studied incidence & prevalence of deranged thyroid profile results using TSH and ATG/TPO in different age groups and gender

We also studied correlation between TSH level and ATG/TPO level in patients with autoimmune thyroid disorder

METHODS: -

Analysis of thyroid profile parameters (T3, T4, TSH, FT3, ATG&TPO)

Thyroid parameters are commonly measured with the help of Immunoassay (ECLIA)

For this study we used e411/e601/e801 modules of Cobas. All modules have same test principle

Principle of Cobas analyzer

Sandwich principle.

- 1st incubation: serum sample, with a biotinylated monoclonal TSH (or any thyroid parameter) -specific antibody and a monoclonal TSH (or any thyroid parameter) -specific antibody labeled with a ruthenium complex react to form a sandwich complex.)
- 2nd incubation: Stepavidin coated microparticles are added, which forms an immune complex. This complex gets adhered to solid phase due to interaction of biotin & sepavidin.
- The reaction mixture is aspirated into the measuring cell where the microparticles get deposited on surface of the electrode. Unbound substances are then removed withProCell/ProCell M. Chemiluminescent emission is induced by electrodes which is measured by a photo-multiplier.
- Results are determined with the help of 2-point calibration curve.

Reference Ranges:-

Reference ranges for thyroid parameters were followed in accordance to

1) Dayan et al. THE LANCET Volume 357 February 24,2001
2) Laboratory evaluation of thyroid function, Indian thyroid guidelines, JAPI, Jan2011, vol 59

	Parameter	Biological Reference range
1	T3	0.8-2.0 ng/mL
2	T4	0.420-24.86 g/dL
3	TSH	0.270-4.20 μIU/mL
4	Free T3	2.0-4.4 pg/mL
5	Free T4	0.93-1.7 ng/dL
6	ATG	115 IU/mL
7	TPO	34 IU/mL

STATISTICAL ANALYSIS METHODS:-

Descriptive and inferential statistical analysis has been used in this study. Chi-square test was used to determine level of significance. ($P<0.05$) as considered statistically significant.

RESULT:

Total 3342 patients were included in the study over period of 6 years. Age range selected was 18 to 60 years. (Mean was 37.04+/-10.79). Out of 3342 patients, 2680 were females (80.19%) and 662 were males (19.81%) (Table-1)

502 patients belonged to age group 18-25 (15.02%), 1112 patient belonged to 26-35 age group (33.27%), 949 patient belonged to age group 36-45 (28.40%) & 779 patient belonged to age group 46-50 (23.31%). Thus maximum patients belonged to 26-35 age group (Table-1)

Table: - 1

	N	%
Gender		
Female	2680	80.19
Male	662	19.81
Age group		
18 – 25	502	15.02
26 – 35	1112	33.27
36 – 45	949	28.40
46 – 50	779	23.31

Overall, free T3 was reduced in 218 patients (6.92%). It was increased in 71 patients (2.25%) & it was normal in 2862 patients (90.83%).

Free T4 was reduced in 824 patients (26.15%). It was increased in 84 patients. It was normal in 2243 patients (71.18%). Hence more patient had drop in free T4 as compared to free T3, Total T3 was reduced in 650 patients (27.30%). It was increased in 36(1.51%) patients. It remained normal in 1695 (71.19%) patients.

Total T4 was reduced in 170 patients (7.14%). It was increased in 53 patients (2.23%). However, it remained normal in 2158 (90.63%) patient.

TSH was reduced in 539 patients. (16.13%). It was increased in 559 patients (16.73%) In 2244 patient it remained normal.

In study done by Unnikrishnan et al. [18], prevalence on hypothyroidism was 9.61% in Mumbai Anti-TPO antibodies were raised in 1341 (40.29%) & it were normal in 1987 (59.71%). Unnikrishnan et al study showed that anti-TPO antibodies were elevated in 21.85% of cases [18]. Thyroglobulin antibodies were raised 1278 (50.53%) & it were normal in 1251 (49.47%) (Table 2)

Table:-2

	N	%
Free T3		
Decrease	218	6.92
Increase	71	2.25
Normal	2862	90.83
Free T4		

Decrease	824	26.15
Increase	84	2.67
Normal	2243	71.18
T3 (Total)		
Decrease	650	27.30
Increase	36	1.51
Normal	1695	71.19
T4(Total)		
Decrease	170	7.14
Increase	53	2.23
Normal	2158	90.63
TSH		
Decrease	539	16.13
Increase	559	16.73
Normal	2244	67.15
Microsomal (TPO) Antibody Titre,Serum		
Abnormal	1341	40.29
Normal	1987	59.71
Thyroglobulin Antibody (ATG),Serum		
Abnormal	1278	50.53
Normal	1251	49.47

In females, reduction in free T3(7.36%) was significant as compared to males (5.07%). However, in males increase in free T3 (4.42%) was more significant as compared to females (1.73%) (p=0.0001)

In females, reduction in free T4 (26.57%) was more significant as compared to males (24.39%). However, in males increase in free T4(4.58%) was more significant as compared to females (2.20%) (p=0.0034)

TPO antibodies were abnormal in 1113 (41.65%) of females & in 228 males (34.76%) (P value=0.0013). This shows derangement in TPO levels was more significant in females as compared to males. On similar grounds, derangement in ATG level was in 1057 (52.38%) females as compared to 221 males(43.25%) (P value=0.002), thus it was statistically significant. (Table-3)

These findings are correlating with study done by Tipu HN et al. [17]

Table: - 3

	Gender				
	Female		Male		p value
	N	%	N	%	
Free T3					
Decrease	187	7.36	31	5.07	0.0001
Increase	44	1.73	27	4.42	
Normal	2309	90.91	553	90.51	
Free T4					
Decrease	675	26.57	149	24.39	0.0034
Increase	56	2.20	28	4.58	
Normal	1809	71.22	434	71.03	
T3 (Total)					
Decrease	540	28.30	10	2.68	0.0856
Increase	29	1.52	7	1.88	
Normal	1339	70.18	356	95.44	
T4(Total)					
Decrease	126	6.60	44	9.30	0.1129
Increase	44	2.31	9	1.90	
Normal	1738	91.09	420	88.79	
TSH					
Decrease	412	15.37	127	19.18	0.0550
Increase	455	16.98	104	15.71	
Normal	1813	67.65	431	65.11	
Microsomal (TPO) Antibody Titre, Serum					
Abnormal	1113	41.65	228	34.76	0.0013
Normal	1559	58.35	428	65.24	
Thyroglobulin Antibody (ATG),Serum					
Abnormal	1057	52.38	221	43.25	0.0002
Normal	961	47.62	290	56.75	

We also compared changes in thyroid hormones & thyroid auto-antibodies with respect to different age groups.

Reduction in free T3 level was most significant in 45-60 age group (10.58%). Same was true for increase in free T3 levels as well (3.06%) (P=0.0001). Decrease in free T4 was however more significantly seen in 36-45 age group (30.43%). Again increase in free T4 was more significant in 45-60 age group (3.48%) (p=0.0153). Similar to free T3, TSH value was reduced significantly in 45-60 age group (35.56%) & was increased also in same age group (18.36%). (P=0.0001). This shows that thyroid hormonal fluctuations with statistical significance were seen in age group of 45-60 years.

Abnormal TPO & ATG antibodies were predominantly seen in 36-45 years' age group. (P=0.0001). In study done by Unnikrishnan, et al [18], prevalence of anti-TPO antibodies was highest in 46-54 age group in metropolitan Indian population. (Table-4)

Table-4

	Age group								
	18 – 25		26 – 35		36 -45		45 – 60		p value
	N	%	N	%	N	%	N	%	
Free T3									
Decrease	26	5.41	49	4.63	67	7.49	76	10.58	0.0001
Increase	11	2.29	21	1.98	17	1.90	22	3.06	
Normal	444	92.31	988	93.38	810	90.60	620	86.35	
Free T4									
Decrease	115	23.91	257	24.29	272	30.43	180	25.07	0.0153
Increase	10	2.08	24	2.27	25	2.80	25	3.48	
Normal	356	74.01	777	73.44	597	66.78	513	71.45	
T3 (Total)									
Decrease	62	17.42	188	24.38	208	29.50	192	35.56	0.0001
Increase	5	1.40	16	2.08	8	1.13	7	1.30	
Normal	289	81.18	567	73.54	489	69.36	341	63.15	
T4(Total)									
Decrease	30	8.22	45	5.84	58	8.23	37	6.85	0.5592
Increase	6	1.64	20	2.59	15	2.13	12	2.22	
Normal	329	90.14	706	91.57	632	89.65	491	90.93	
TSH									
Decrease	57	11.35	164	14.75	164	17.28	154	19.77	0.0001

Increase	70	13.94	181	16.28	165	17.39	143	18.36	
Normal	375	74.70	767	68.97	620	65.33	482	61.87	
Microsomal (TPO) Antibody Titre, Serum									
Abnormal	140	28.11	452	40.83	451	47.57	299	38.53	0.0001
Normal	358	71.89	655	59.17	497	52.43	477	61.47	
Thyroglobulin Antibody (ATG),Serum									
Abnormal	142	37.37	397	49.19	432	57.52	307	51.95	0.0001
Normal	238	62.63	410	50.81	319	42.48	284	48.05	

We compared abnormal or elevated anti-TPO levels with abnormal thyroid parameters levels. We observed that, abnormal TPO levels were significantly associated with low free T3 than increase in free T3. Same finding was observed with free T4, total T3 & total T4. However, in case of TSH, increase in TSH level was more significant as compared to reduction in TSH levels. We also compared abnormal TPO values with abnormal ATG values, which was also significant. All had p value of 0.0001. (Table-5)

Table: - 5

	Microsomal (TPO) Antibody Titre, Serum				
	Abnormal		Normal		p value
	n	%	n	%	
Free T3					
Decrease	115	9.12	102	5.41	0.0001
Increase	41	3.25	29	1.54	
Normal	1105	87.63	1756	93.06	
Free T4					
Decrease	438	34.73	385	20.40	0.0001
Increase	47	3.73	37	1.96	
Normal	776	61.54	1465	77.64	
T3 (Total)					
Decrease	295	31.86	354	24.38	0.0001
Increase	20	2.16	16	1.10	
Normal	611	65.98	1082	74.52	
T4(Total)					
Decrease	114	12.31	55	3.78	0.0001
Increase	28	3.02	25	1.72	
Normal	784	84.67	1375	94.50	
TSH					
Decrease	251	18.72	277	13.94	0.0001
Increase	403	30.05	156	7.85	
Normal	687	51.23	1554	78.21	
Thyroglobulin Antibody (ATG),Serum					
Abnormal	868	87.85	406	26.50	0.0001
Normal	120	12.15	1126	73.50	

We also found positive correlation between Anti TPO, TSH and ATG levels, which was of statistically significant (P value=0.0001) (Table-6)

Table: -6

Variable	Correlation coefficient (r)	95% CI of r	p value
Free T3	0.02653	-0.008 to 0.061	0.1367
Free T4	-0.01725	-0.05215 to 0.017	0.3333
T3(Total)	0.01429	-0.0259 to 0.0544	0.4862
T4 (Total)	-0.03729	-0.077 to 0.0029	0.0690
Thyroglobulin Antibody (ATG) Serum	0.3285	0.2932 to 0.3629	0.0001
TSH (Ultrasensitive)	0.2207	0.1873 to 0.2537	0.0001

We also analyzed data in 18-45 years' females considering more prevalence of autoimmune hypothyroidism in females compared to males. Total number of females who belonged to age group of 18-45 years were 2114. In our study, maximum females belonged to age group between 26-35 years (44.99%) (Table-7).

Table: -7

Age group	N	%
18 – 25	409	19.35
26 – 35	951	44.99
36 – 45	754	35.66

In them, free T3 was reduced in 127(6.29%) patients and it was normal in 1859(92.08%) patients. Free T4 was reduced in 548 (27.21%) of patients and it was normal in 1423(70.65%) patients. Total T3 was reduced in 391(25.93%) of patients and it was normal in 1094 (72.55%) of patients Total T4 was reduced in 101 (6.7%) of patients, however it was normal in 1372 (90.98%) of patients. Thus T3 was reduced in more patients as compared to T4. TSH was reduced in 302 (14.29%) patients and it was increased in 350 (16.56%) of patients. TPO antibodies were abnormal in 880 patients (41.73%) and ATG antibodies were abnormal in 819 (51.90%) patients. (Table- 8)

Table: - 8

	N	%
Free T3		
Decrease	127	6.29
Increase	33	1.63
Normal	1859	92.08
Free T4		
Decrease	548	27.21
Increase	43	2.14
Normal	1423	70.65
T3 (Total)		
Decrease	391	25.93
Increase	23	1.52
Normal	1094	72.55
T4(Total)		
Decrease	101	6.70
Increase	35	2.32
Normal	1372	90.98
TSH		
Decrease	302	14.29
Increase	350	16.56
Normal	1462	69.15
Microsomal (TPO) Antibody Titre, Serum		
Abnormal	880	41.73
Normal	1229	58.27
Thyroglobulin Antibody (ATG),Serum		
Abnormal	819	51.90
Normal	759	48.10

We observed that TPO antibodies were raised in age group of 36-45 years as compared to other age groups. (P value=0.0001). Similarly, ATG antibodies were also raised in the same age group (P value=0.0001).

This shows that 36-45 years is the most commonly affected age group in autoimmune thyroid disease, overall as well as in females. (Table-9)

In study done by Jantikar et al [19], Anti-TPO antibodies were most commonly seen in 21-30 years.
We also compared abnormal anti-TPO antibodies with respect to other thyroid parameters.

We got significant correlation between reduction in Free T3, Free T4, Total T4 & Total T4 levels with abnormal anti-TPO

levels. However, with respect to TSH, increase in TSH was more significant as compared to reduction in TSH levels.

Also ATG antibodies were significantly elevated in patients with abnormal anti-TPO antibodies (p=0.0001) (Table-10).

Table: -9

	Age group						
	18 – 25		26 – 35		36 -45		p value
	N	%	N	%	N	%	
Free T3							
Decrease	25	6.36	45	4.94	57	7.97	0.1060
Increase	9	2.29	13	1.43	11	1.54	
Normal	359	91.35	853	93.63	647	90.49	
Free T4							
Decrease	100	25.45	228	25.03	220	30.77	0.0680
Increase	8	2.04	17	1.87	18	2.52	
Normal	285	72.52	666	73.11	477	66.71	
T3 (Total)							
Decrease	51	17.65	170	26.03	170	30.04	0.0027
Increase	5	1.73	12	1.84	6	1.06	
Normal	233	80.62	471	72.13	390	68.90	
T4(Total)							
Decrease	23	7.96	35	5.36	43	7.60	0.4897
Increase	6	2.08	16	2.45	13	2.30	
Normal	260	89.97	602	92.19	510	90.11	
TSH							
Decrease	49	11.98	133	13.99	120	15.92	0.2855
Increase	63	15.40	156	16.40	131	17.37	
Normal	297	72.62	662	69.61	503	66.71	
Microsomal (TPO) Antibody Titre, Serum							
Abnormal	125	30.71	387	40.78	368	48.87	0.0001
Normal	282	69.29	562	59.22	385	51.13	
Thyroglobulin Antibody (ATG),Serum							
Abnormal	123	40.59	343	50.52	353	59.23	0.0001
Normal	180	59.41	336	49.48	243	40.77	

Table: -10

	Microsomal (TPO) Antibody Titre, Serum				
	Abnormal		Normal		p value
	n	%	N	%	
Free T3					
Decrease	72	8.60	55	4.66	0.0012
Increase	15	1.79	17	1.44	
Normal	750	89.61	1108	93.90	
Free T4					
Decrease	292	34.89	256	21.69	0.0001
Increase	23	2.75	20	1.69	
Normal	522	62.36	904	76.62	
T3 (Total)					
Decrease	188	31.07	203	22.48	0.0009
Increase	8	1.33	15	1.66	
Normal	409	67.60	685	75.86	
T4(Total)					
Decrease	74	12.24	27	2.99	0.0001
Increase	16	2.64	19	2.10	
Normal	515	85.12	857	94.91	
TSH					
Decrease	142	16.14	155	12.62	0.0001
Increase	259	29.43	91	7.40	
Normal	479	54.43	983	79.98	
Thyroglobulin Antibody (ATG),Serum					
Abnormal	564	88.54	254	27.08	0.0001
Normal	73	11.46	684	72.92	

DISCUSSION: -

Statistically significant findings of present study: -

- Significant prevalence of anti-TPO and anti-TG in females as compared to males
- Abnormal (Low & High) TSH levels were significantly seen in 45-60 age group.
- Abnormal ATG & TPO levels were seen in 36-45 age group (overall as well as in females between 18-45 age group)
- Abnormal TPO levels were associated with low free T3, low free T4, low Total T3, low Total T4 levels but with increased TSH levels
- Abnormal TPO & ATG antibodies had positive statistical correlation.

Laboratory tests play significant role in diagnosing autoimmune thyroid disorders. Among all tests which are available, Anti-TPO antibodies play an important role in diagnosing autoimmune hypothyroidism. Thyroid peroxidase is the trans-membrane protein located apical membrane of thyroid follicular cells which is involved in synthesis of thyroid hormone.

Approximately 90% of patient diagnosed with Hashimoto thyroiditis have anti-TPO antibodies [20]. We have hypothesized that Abnormal TPO antibodies are more commonly associated with derangement in TSH levels as compared to normal TSH levels (p=0.0001). In study done by Al Rabi, [21], positive Anti TPO(p=0.0036) and Anti TG(p=0.0001) were associated with deranged Thyroid profile. Similarly, Brown et al concluded that abnormal Anti-TPO antibody is 60% associated with increase in TSH levels [22] (p <0.001). Loh et al showed that derangement in TSH levels in pregnancy is more commonly associated with abnormal anti-TPO levels (p=0.004) [23]

Tipu HN et al [17] got statistically significant anti-TPO antibodies in females as compared to males. (p=0.0001). However, they did not get any statistical correlation for Anti-TG levels. In our study we found out statistically significant values for anti TPO (0.0013) as well as for Anti-TG (0.0002) in females as compared to males. Similarly, in study done by Unnikrishnan et al, prevalence of anti-TPO antibodies was more in females as compared to males in eight cities across India [18] (P<0.005). Dhakal et al [24] also got that anti-TPO antibodies had more prevalence in females as compared to males.

In our study 40% of subjects were positive for anti-TPO antibodies. In study done by Jantikar [19], 44% patient had abnormal anti-TPO antibodies. In study done by Daneshpazhooh et al [25], abnormal anti-TPO antibodies were found in 18% of patients. Vanderpump MPJ et al did study in Australia & concluded that anti-TPO antibodies were found in 21% of patients [26]. In study conducted in Greece, prevalence of anti-TPO antibodies was 24.1% [27]

Since prevalence of autoimmune hypothyroidism was commonly seen in reproductive age group in females, we did detail analytical study of females between 18-45 years of age. We concluded that prevalence of anti-TPO & Anti-TG antibodies was maximum in 36-45 years of age. Jantikar [19] also found similar finding. In study done by Bhattacharjee et al, no significant association was found between age of children & Anti-TG levels. [28]

Findings which were not statistically significant are as follows
Association of T3, T4, TSH with gender
Association of total T4 with respect to different age groups

In females of age group between 18-45 years, association of free T3, free T4, total T4 & TSH with respect to age groups

CONCLUSION: -

Present study concludes that anti-TPO antibodies are most

commonly associated with thyroid dysfunction, second common being anti-TG antibodies.

The most common age group for these antibodies is 36-45 years. We did a detailed analysis of females in reproductive age group & concluded that in females most common age group to get affected is 36-45 years.

Hence females of reproductive age group should undergo regular screening for TSH and Anti-TPO /Anti-TG levels for early detection of autoimmune hypothyroidism. It plays vital role in follow-up & knowing response to treatment.

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