

**Original Article**

## **A Study on Levels of Vit D and it's Correlation with Anti TPO Antibody among Hypothyroidism Patients**

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### **ABSTRACT:**

**INTRODUCTION:** Autoimmune thyroid disease (AITD) is detected most easily by measuring circulating antibodies against thyroid peroxidase (TPO) and thyroglobulin(Tg) . As antibodies to Tg alone are uncommon, it is reasonable to measure only TPO antibodies. About 5–15% of euthyroid women and up to 2% of euthyroid men has thyroid antibodies; such individuals are at increased risk of developing thyroid dysfunction. Almost all patients with autoimmune hypothyroidism have TPO antibodies, usually at high levels. Indian population show the high prevalence of hypothyroidism and vitamin D deficiency with a brief research in this particular field, the following study was undertaken to find the correlation between 25(OH)D and anti-TPO antibody in patients of hypothyroidism.

**OBJECTIVE:** (1) To estimate serum TPO Ab levels among patients of hypothyroidism and healthy controls (2) To find the correlation between 25(OH)D and anti-TPO(Ab) positive cases and anti-TPO(Ab) negative cases in hypothyroid group.

**METHODOLOGY:** It was a case control study conducted in central lab Gauhati Medical College & Hospital, Guwahati from august 2014 to july 2015. Study population comprised of 45cases and 45 controls. Blood serum was used to test the Vit D and TPO Ab. Data were analysed using epi-info by proportion, mean, SD and Correlation. T-test was used as test of significance.

**RESULTS:** mean Vitamin D level was significantly decreased in hypothyroid cases as compare with controls. Total 30 TPO Ab positive cases and 15 TPO Ab negative cases were there in the study. Among TPO AB positive 11 were males and 19 were females. statistically significant but negative correlation was found between serum Vitamin D and TPO positive cases and no correlation was seen between serum Vitamin D and TPO negative cases in the case group. mean Vitamin D levels was significantly decreased in TPO positive patients than in TPO negative patients.

**CONCLUSION:** The prevalence of TPOAb positivity was more in females than males in the case group. A negative correlation was observed between 25(OH) Vitamin D and TPO Ab(+ve) cases in the case group

### **INTRODUCTION:**

Reduced production of thyroid hormone by thyroid gland leads to development of hypothyroidism which becomes a common endocrine disorder now a day. . Thyroid diseases affect about 42 million people in India and hypothyroidism is the most common thyroid disorder affecting approximately one in 10 adults in India.(1,2,3) Autoimmune thyroid disease (AITD) is detected most easily by measuring circulating antibodies against thyroid peroxidase (TPO) and thyroglobulin(Tg) . As antibodies to Tg alone are uncommon, it is reasonable to measure only

TPO antibodies. About 5–15% of euthyroid women and up to 2% of euthyroid men has thyroid antibodies; such individuals are at increased risk of developing thyroid dysfunction. Almost all patients with autoimmune hypothyroidism have TPO antibodies, usually at high levels.(4) The etiology and pathogenesis of most autoimmune disorders including AITD remain obscure and a number of factors including genetic and environmental have been implicated in their pathogenesis. Out of these, one of the most recent agents is deficiency of 25(OH)D.(5) Vitamin D mediates its effect through binding to vitamin D receptor(VDR), and activation of VDR-responsive genes, while VDR gene polymorphism was found to be associated with autoimmune thyroid disease especially Graves disease .(6) Indian population show the high prevalence of hypothyroidism and vitamin D deficiency with a brief research in this particular field, the following study was undertaken to find the correlation between 25(OH)D and anti-TPO antibody in patients of hypothyroidism.

**OBJECTIVE:** (1) To estimate serum TPO Ab levels among patients of hypothyroidism and healthy controls (2) To find the correlation between 25(OH)D and anti-TPO(Ab) positive cases and anti-TPO(Ab) negative cases in hypothyroid group.

**MATERIAL AND METHOD:**

The present study with 90 subjects aged between 20-80 years was conducted in central lab in two study group-case group with 45 subjects consisting of newly diagnosed cases not on treatment and control group also with 45 subjects consisting of healthy individual. Serum 25(OH) D and serum anti TPO antibody level were estimated in both the case and the control group. Values of anti-TPO antibody was interpreted as : (7)

>= 35IU/ml: positive anti –TPOAb level

< 35 IU/ml: negative anti-TPOAb level

Estimations of 25(OH)D was done by ELISA. Estimation of Anti-TPOAb was done by IMMULITE 1000 Immunoassay system, SIEMENS. After getting informed written consent the blood samples were taken and analyzed. Data were analyzed using epi-info by proportion, mean, SD and Correlation. T-test was used as test of significance.

**RESULTS:**

The mean age of cases and controls were 37.37 and 39.8 years respectively.

Table 1: Comparison of Vitamin D levels in Case and Control groups

	Case	Control	P value
Vitamin D	19.796 ± 12.966	29.466±7.348	<0.0001*

\*Statistically significant

Table 1 shows that mean Vitamin D level was significantly decreased in hypothyroid cases as compare with controls.

Table 2 Comparison of Vit D levels among males and females

	Males	Females	P value
Vit D	21.422 ±14.572	18.711±11.942	0.4984

Table 2 shows that mean level of Vit D is less among females but the difference was not significant.

Table 3: Prevalence of TPO Ab positivity and TPO Ab negativity according to gender in case group

	Male	Female
Total no. of cases	19	26
TPO +ve	11(24.4%)	19(42.2%)
TPO -ve	7(15.5%)	8(17.7%)

Table 3 shows that total 30 TPO Ab positive cases and 15 TPO Ab negative cases were there in the study. Among TPO AB positive 11 were males and 19 were females. In the control group, all the patients had TPO(Ab) levels <35 IU/ml suggesting TPO(Ab)negativity.

Table 4: Correlation between 25(OH)D and TPO Positive and TPO negative cases in Case group:

	25(OH) D	
	r (correlation coefficient)	p value
TPO positive	-0.5153	0.0036
TPO Negative	0.07900	0.7796

Table 4 shows that statistically significant but negative correlation was found between serum Vitamin D and TPO positive cases and no correlation was seen between serum Vitamin D and TPO negative cases in the case group

Table 5 : Comparison of Vitamin D levels in TPO positive and TPO negative cases

	TPO +ve(>=35IU/ml) (n=30 )	TPO -ve(<35IU/ml) (n= 15 )	P value
25(OH)D (ng/ml)	19.571±15.009	20.245±7.835	P=0.0362*

Table 5 shows that on comparing the mean Vitamin D levels was significantly decreased in TPO positive patients than in TPO negative patients

#### **DISCUSSION:**

In the present study we found that the percentage of Anti-Thyroid peroxidase Ab positivity (TPO +ve) was more in females than in males in the case group. The high prevalence of autoimmunity (TPO+ve) in females can be explained by the presence of higher levels of intra thyroidal immune CD4<sup>+</sup> T cells in females.(8) Presence of TPO Ab positivity can be seen in almost 100% of such patients as a secondary response to thyroid injury. Kivity et al in their study also found that Autoimmune Thyroid disease proved by the assay of thyroid peroxidase antibody was more common in females than in males (88% vs. 64%) which are consistent with our study. (9) In our study we found that the mean 25(OH) Vitamin D level was lower in females than in males in the case group and control group though the decrease was not significant. The decrease levels of 25(OH)Vitamin D in females may be attributed largely to the indoor activities of the females leading to inadequate sunlight exposure and consequently decreased conversion of 7-dehydrocholesterol to previtamin D<sub>3</sub> . Similarly Mackawy et al in their work found insignificant decrease in the levels of 25(OH) Vitamin D levels in females than in males in control and hypothyroid patients.(6)

In the present study the mean 25(OH) Vitamin D level in the case group was significantly decreased in TPO Ab positive cases than in TPO Ab negative cases suggesting an inverse relation between TPOAb positivity and serum 25(OH)D levels. Thus the role of Vitamin D supplementation in autoimmune thyroid disease cannot be ruled out. The similar finding was also observed by other authors like Choi YM et al and Shin DY et al.(10,11) However, Goswami et al found no significant difference in the serum 25(OH)D levels in TPOAb positive and negative cases.(12) A negative correlation was found between 25(OH) Vitamin D and TPO positive Ab in the case group in our study This finding was consistent with other studies by Fawzy et al and Goswami et al.(13,12) These findings clearly suggest a possible association between TPO Ab titres and 25(OH) Vitamin D levels. Effraimidis G found in a small randomized controlled trial that vitamin D treatment significantly decreased TPOAb and TgAb compared with placebo treatment in AITD patients.(14)

#### **CONCLUSION:**

The prevalence of TPOAb positivity was more in females than males in the case group. A negative correlation was observed between 25(OH) Vitamin D and TPO Ab(+ve) cases in the case group. Further clinical trials are needed to see the effect of Vit D supplementation on TPO Ab titer.

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