

Prevalence and Clinical Profile of Autoimmune Hypothyroidism in Adult Patients Attending a Tertiary Care Hospital

Dr. Sandesh L¹; Dr Pratham Jain P J²; Dr Kashinath Biradar³; Dr Ravi T Chikkannanavar⁴

¹ Assistant professor, General Medicine, Hassan Institute of Medical Sciences Hassan

²Assistant Professor, Department of General Medicine HIMS Hassan,

³Senior Resident Department of General Medicine, Hassan Institute of Medical Sciences Hassan

⁴ Associate Professor, Department of General Medicine, Hassan Institute of Medical Sciences Hassan

 OPEN ACCESS

ABSTRACT

Background: Hypothyroidism is a common endocrine disorder worldwide, with autoimmune thyroiditis being the leading cause in iodine-sufficient regions. Anti-thyroid peroxidase (anti-TPO) antibodies play a central role in the pathogenesis and progression of autoimmune hypothyroidism.

Objectives: To determine the prevalence of autoimmune hypothyroidism and to study the clinical and biochemical profile of affected patients.

Methods: This hospital-based cross-sectional study included 150 newly diagnosed hypothyroid patients over one year. Clinical evaluation and biochemical investigations, including thyroid function tests (TSH, T₃, T₄) and anti-TPO antibody estimation, were performed.

Results: Anti-TPO antibodies were positive in 62% of patients. Females were predominantly affected (74.7%). Anti-TPO positive patients had significantly higher TSH levels and a higher proportion of overt hypothyroidism. Fatigue and weight gain were the most common presenting symptoms.

Conclusion: Autoimmune hypothyroidism is the predominant cause of hypothyroidism in adults. Anti-TPO positivity correlates with disease severity, highlighting the importance of early identification and management.

Keywords: Autoimmune hypothyroidism, Anti-TPO antibodies, Hashimoto's thyroiditis

Copyright © International Journal of Medical and Pharmaceutical Research

INTRODUCTION

Hypothyroidism is a common endocrine disorder caused by inadequate thyroid hormone production, leading to multisystem involvement. It affects approximately 5–10% of adults worldwide and is more common in women and the elderly [1]. In India, hypothyroidism represents a significant public health concern, affecting 10–12% of adults [1].

Autoimmune thyroid disease (AITD), particularly Hashimoto's thyroiditis, is the leading cause of hypothyroidism in iodine-sufficient regions [2]. The pathogenesis involves immune-mediated destruction of thyroid tissue, primarily by antibodies targeting thyroid peroxidase (TPO) and thyroglobulin [3]. Anti-TPO antibodies are the most sensitive serological markers for autoimmune thyroid disease and can be detected years before clinical hypothyroidism develops [4].

Longitudinal studies, including the Whickham survey, have demonstrated that anti-TPO positivity significantly increases the risk of progression from subclinical to overt hypothyroidism [4]. Despite the high prevalence of hypothyroidism in India, there is limited data on the prevalence and clinical profile of autoimmune hypothyroidism, especially from South India.

This study aimed to determine the prevalence of autoimmune hypothyroidism and to evaluate the clinical and biochemical characteristics of adult patients attending a tertiary care hospital.

Methods

Study Design and Setting

A hospital-based cross-sectional study was conducted in the Department of General Medicine, Hassan Institute of Medical sciences Hassan, over a period of one year

Study Population

Adult patients (≥ 18 years) newly diagnosed with hypothyroidism (TSH >4.5 mIU/L) were included.

Exclusion Criteria:

- Pregnant women
- Post-thyroidectomy patients
- Drug-induced hypothyroidism
- Known autoimmune disorders
- Chronic kidney disease stage ≥ 4

Sample Size

Based on previous Indian studies reporting ~60% anti-TPO positivity [5], the sample size was calculated using:
 $n=4pq/d^2$

where $p = 60$, $q = 40$, $d = 8$. The calculated sample size was 150 patients.

Data Collection

Clinical evaluation included history, demographic data, and presenting symptoms. Laboratory investigations included:

- Thyroid function tests (TSH, T3, T4)
- Anti-TPO antibody estimation
- Complete blood count
- Lipid profile

Ethical Considerations: The study was approved by the Institutional Ethics Committee of Hassan Institute of Medical Sciences, Hassan. Written informed consent was obtained from all participants, and confidentiality of their information was maintained.

Statistical Analysis

Data were analyzed using [software, e.g., SPSS version X]. Continuous variables were expressed as mean \pm SD, and categorical variables as percentages. Student's t-test and Chi-square test were used to compare groups, with $p < 0.05$ considered statistically significant.

Results

Table 1. Demographic Profile of Patients (n=150)

Parameter	Value
Age (mean \pm SD, years)	42.3 \pm 11.5
Age range (years)	18–68
Gender	Female: 112 (74.7%)Male: 38 (25.3%)

Table 2. Prevalence of Anti-TPO Antibodies

Anti-TPO Status	Number of Patients	Percentage
Positive	93	62%
Negative	57	38%

Table 3. Clinical Symptoms of Hypothyroid Patients

Symptom	Anti-TPO Positive (n=93)	Anti-TPO Negative (n=57)
Fatigue	78%	65%
Weight gain	65%	48%
Cold intolerance	42%	33%
Constipation	35%	28%
Hair loss	28%	20%

Table 4. Thyroid Function Test Results

Parameter	Anti-TPO Positive	Anti-TPO Negative
Mean TSH (mIU/L)	18.5 ± 7.2	10.3 ± 4.8
Mean T3 (ng/dL)	0.85 ± 0.28	1.02 ± 0.34
Mean T4 (μ g/dL)	4.8 ± 1.5	6.1 ± 1.7
Overt hypothyroidism (%)	71%	44%

Table 5. Distribution of Hypothyroidism by Gender and Anti-TPO Status

Gender	Anti-TPO Positive	Anti-TPO Negative	Total
Female	72	40	112
Male	21	17	38
Total	93	57	150

Discussion

Autoimmune hypothyroidism is the leading cause of hypothyroidism in iodine-sufficient regions, primarily due to Hashimoto's thyroiditis. In this study, 62% of newly diagnosed hypothyroid patients were positive for anti-TPO antibodies, which aligns with previous Indian studies reporting prevalence rates between 58% and 65% [1,5]. This confirms that autoimmune mechanisms play a major role in hypothyroidism and underscores the need for routine antibody testing.

Female predominance (74.7%) observed in this study is consistent with global and Indian data [1,4]. The higher susceptibility in females is attributed to estrogen-mediated immune modulation, X-chromosome-linked genetic factors, and the general higher prevalence of autoimmune conditions in women. The mean age of presentation was 42.3 years, suggesting that autoimmune hypothyroidism commonly manifests during middle age, in line with previous studies [5]. Clinically, fatigue (78%) and weight gain (65%) were the most common presenting symptoms in anti-TPO positive patients, followed by cold intolerance and constipation. Anti-TPO positive patients experienced a higher symptom burden than antibody-negative patients, indicating that autoimmune thyroid damage may result in more severe manifestations [6].

Thyroid function analysis revealed higher TSH levels (18.5 ± 7.2 mIU/L) and a greater proportion of overt hypothyroidism (71%) among anti-TPO positive patients compared to negatives. These findings support longitudinal studies, including the Whickham survey, showing that anti-TPO positivity predicts progression from subclinical to overt hypothyroidism [4]. Reduced T3 and T4 levels in antibody-positive patients further indicate progressive thyroid failure.

The correlation between anti-TPO positivity and disease severity highlights the prognostic value of antibody testing. Anti-TPO positive individuals require closer clinical monitoring and early intervention with levothyroxine to prevent complications. Autoimmune hypothyroidism is also associated with dyslipidemia and increased cardiovascular risk, making early identification and management critical [6,7].

Routine anti-TPO antibody testing in newly diagnosed hypothyroid patients provides essential information for patient counseling, disease monitoring, and predicting progression. Screening of first-degree relatives may also be considered due to higher genetic susceptibility.

Conclusion

- Autoimmune hypothyroidism is the predominant cause of hypothyroidism in adults.
- Anti-TPO positivity correlates with higher TSH levels, overt hypothyroidism, and greater symptom burden.
- Middle-aged females are most commonly affected.
- Routine anti-TPO testing is essential for early detection, prognostication, and optimal management.

Limitations

- Single-center study, limiting generalizability.
- Cross-sectional design precludes assessment of long-term progression.
- Lack of longitudinal follow-up to evaluate disease evolution and therapy outcomes.

Future Directions

- Multicenter longitudinal studies to assess progression from subclinical to overt hypothyroidism.
- Screening of first-degree relatives for early detection of autoimmune thyroid disease.
- Genetic and immunological studies to better understand pathogenesis and risk factors.

REFERENCES

1. Unnikrishnan AG, Kalra S, Sahay RK, Bantwal G, John M, Tewari N. Prevalence of hypothyroidism in adults: An epidemiological study in eight cities of India. *Indian J Endocrinol Metab.* 2013;17(4):647–652.
2. Weetman AP. Autoimmune thyroid disease. *Autoimmunity.* 2004;37(4):337–340.
3. Ajjan RA, Weetman AP. The pathogenesis of Hashimoto's thyroiditis. *Horm Metab Res.* 2015;47(10):702–710.
4. Vanderpump MPJ, Tunbridge WMG, French JM, et al. The incidence of thyroid disorders in the community. *Clin Endocrinol (Oxf).* 1995;43(1):55–685.
5. Marwaha RK, Tandon N, Garg MK, et al. Thyroid status two decades after salt iodization in India. *Clin Endocrinol (Oxf).* 2012;76(6):905–910.
6. Bjøro T, Holmen J, Krüger O, et al. Prevalence of thyroid disease in a population study. *Eur J Endocrinol.* 2000;143(5):639–647.
7. Duntas LH. Thyroid disease and lipids. *Thyroid.* 2002;12(4):287–293.
8. Pearce EN, Farwell AP, Braverman LE. Thyroiditis. *N Engl J Med.* 2003;348(26):2646–