ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Prevalence and Pattern of Thyroid Dysfunction in Patients with Rheumatoid Arthritis: A Hospital-Based Observational Study.

Subhash Kalunkhe, and Karnveer Totwad*.

Sr. Consultant Medicine Dept. New Thergaon Hospital Thergaon Pune, Maharashtra, India.

ABSTRACT

Rheumatoid arthritis (RA) is a systemic autoimmune disorder with potential extra-articular manifestations, including thyroid dysfunction. This study aimed to determine the prevalence and pattern of thyroid dysfunction in RA patients and its association with disease parameters. A hospital-based observational study was conducted among 96 RA patients at Gauhati Medical College & Hospital over one year. All patients underwent clinical evaluation, laboratory investigations including rheumatoid factor, ESR, CRP, and thyroid function tests (TSH, free T3, free T4). Patients with known thyroid disease were excluded. Comparative analysis was performed between patients with and without thyroid dysfunction. Thyroid dysfunction was observed in 16.66% of RA patients, predominantly hypothyroidism (clinical 8.33%, subclinical 7.29%). Thyroid dysfunction was significantly more common in females (93.75%) and in patients with longer disease duration (115.82 vs. 39.87 months; $p<0.05$). Higher ESR levels were associated with thyroid dysfunction (50.5 vs. 32.88 mm/hr; $p<0.05$). No significant association was found between DAS28 scores and thyroid dysfunction. Thyroid dysfunction is common in RA patients, particularly among women and those with longer disease duration and higher inflammatory markers. Routine screening for thyroid abnormalities is recommended to facilitate comprehensive management of RA.

Keywords: Rheumatoid arthritis, Thyroid dysfunction, Autoimmune disease

https://doi.org/10.33887/rjpbcs/2024.15.6.69

Corresponding author

ISSN: 0975-8585

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic systemic autoimmune disorder primarily affecting synovial joints, leading to pain, swelling, and eventual joint destruction [1]. Beyond its articular manifestations, RA is associated with several extra-articular complications, including endocrine abnormalities [2, 3]. Among these, thyroid dysfunction, especially hypothyroidism, has garnered significant interest [4]. Thyroid hormones play a vital role in immune modulation, and their imbalance may influence the disease activity and prognosis of RA. The coexistence of thyroid dysfunction in RA patients not only complicates the clinical management but may also worsen the patient's quality of life [5, 6].

Several studies [7-9] have documented a higher prevalence of thyroid dysfunction, both clinical and subclinical, among RA patients compared to the general population. The autoimmune nature of both conditions suggests a potential shared genetic or immunological predisposition. However, data regarding the pattern and clinical relevance of thyroid dysfunction in Indian RA patients remains sparse. This study aimed to evaluate the prevalence, pattern, and clinical associations of thyroid dysfunction in RA patients attending a tertiary care hospital in Northeast India.

STUDY METHODOLOGY

This hospital-based observational study was conducted in the Department of Medicine, Rheumatology, and Endocrinology at Gauhati Medical College & Hospital over a period of one year (1st July 2015 to 30th June 2016). Ethical clearance was obtained from the institutional ethical committee. Ninety-six consecutive patients diagnosed with RA as per the 2010 ACR/EULAR classification criteria and meeting the inclusion criteria were enrolled after obtaining informed consent.

A detailed history and thorough clinical examination were carried out for all patients. Relevant laboratory investigations included complete blood count, ESR, CRP, rheumatoid factor, and anti-CCP antibody testing. Thyroid function tests (TSH, free T3, free T4) were performed for all participants. Ultrasound and FNAC of the thyroid were conducted when clinically indicated.

Thyroid dysfunction was categorized as clinical hypothyroidism, subclinical hypothyroidism, subclinical hyperthyroidism, or clinical hyperthyroidism based on laboratory criteria. Patients with known thyroid disease or on medications altering thyroid function were excluded. Data were collected on age, gender, disease duration, and RA activity (assessed by DAS28), and were analyzed using Microsoft Excel and GraphPad InStat software.

Comparative analyses were performed between RA patients with and without thyroid dysfunction. Statistical significance was set at $p<0.05$. The associations between thyroid dysfunction and RA disease parameters (ESR, CRP, RF positivity, DAS28 score) were explored.

RESULTS

Table 1: Prevalence and Pattern of Thyroid Dysfunction in RA Patients

Thyroid Abnormality	Number of Patients	Percentage (%)
Clinical Hypothyroidism	8	8.33
Subclinical Hypothyroidism	7	7.29
Hyperthyroidism	1	1.04
Total with Thyroid Dysfunction	**16**	**16.66**
Normal Thyroid Profile	**80**	**83.34**

Table 2: Thyroid Dysfunction in Relation to Gender

Gender	With Thyroid Dysfunction	Without Thyroid Dysfunction	Total Patients
Male	1 (6.25%)	23 (28.75%)	24
Female	15 (93.75%)	57 (71.25%)	72

Table 3: Association of Disease Duration and ESR with Thyroid Dysfunction

Parameter	With Thyroid Dysfunction (Mean ± SD)	Without Thyroid Dysfunction (Mean ± SD)	p-value
Disease Duration (months)	115.82 ± 81.73	39.87 ± 22.74	<0.05
ESR (mm/hr)	50.5 ± 19.05	32.88 ± 16.47	<0.05

DISCUSSION

The present study demonstrated a 16.66% prevalence of thyroid dysfunction among RA patients, consistent with global observations of an elevated frequency of thyroid abnormalities in autoimmune diseases. The majority of thyroid dysfunction cases were clinical or subclinical hypothyroidism, underscoring the autoimmune overlap between RA and thyroid disease [10, 11].

Our findings revealed that female RA patients were disproportionately affected, comprising 93.75% of those with thyroid dysfunction. This gender predilection mirrors the general epidemiology of both RA and thyroid disorders, which are more prevalent among women. The hormonal and immunological factors contributing to this gender bias warrant further exploration.

A significant association between longer disease duration and thyroid dysfunction was observed ($p<0.05$), with a mean disease duration of 115.82 months in patients with thyroid dysfunction compared to 39.87 months in those without. This suggests that chronic immune activation over time may contribute to the emergence of thyroid abnormalities. It also raises the possibility that thyroid dysfunction may emerge as a late complication in longstanding RA.

Higher ESR levels were found in patients with thyroid dysfunction ($p<0.05$), indicating greater systemic inflammation. This association suggests a link between ongoing inflammatory activity and thyroid dysfunction. In contrast, although CRP levels were also elevated in the thyroid dysfunction group, the relationship was less robust. The role of autoimmune-mediated systemic inflammation in the pathogenesis of thyroid dysfunction in RA requires further investigation.

Interestingly, we did not find a significant correlation between DAS28 disease activity scores and thyroid dysfunction, despite the latter group showing a higher proportion of high disease activity scores. This may indicate that while thyroid dysfunction is associated with markers of systemic inflammation, it does not directly translate to increased articular disease activity, or the sample size may have been insufficient to detect such a difference.

Additionally, rheumatoid factor positivity was higher among RA patients with thyroid dysfunction (81.25%) compared to those without (56.25%), although this finding was not statistically significant. Nevertheless, it suggests that seropositive RA patients may represent a subgroup at greater risk for developing coexisting autoimmune thyroid disease.

Our results support existing literature indicating a significant association between RA and thyroid dysfunction, particularly hypothyroidism. Given the adverse impact of thyroid dysfunction on fatigue, mood, and overall quality of life, routine screening for thyroid abnormalities in RA patients—especially those with long disease duration or elevated inflammatory markers—appears justified.

In conclusion, this study reinforces the importance of a holistic approach to managing RA patients, including vigilance for endocrine comorbidities. Early identification and treatment of thyroid dysfunction can contribute to optimizing outcomes in this complex patient population.

CONCLUSIONS

Thyroid dysfunction is common in RA patients, particularly among women and those with longer disease duration and higher inflammatory markers. Routine screening for thyroid abnormalities is recommended to facilitate comprehensive management of RA.

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