Original Research Article

Study of thyroid function in rheumatoid arthritis patients presenting at Phulo Jhano Medical College

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Abstract

Background: Rheumatoid arthritis (RA) is an autoimmune disorder where the immune system assaults healthy tissues within the body. RA can damage the skin, eyes, and heart, among other organs. Underactive thyroid disease, such as hypothyroidism and Hashimoto's thyroiditis, is more common in people with RA. And it appears that the link is reciprocal, since persons with thyroid disease are more likely to get RA. **Methods:** It was Cross-sectional study, Study conducted in the department of Physiology at Phulo Jhano Medical College. Total 50 patients were enrolled in our study, who had suffering from Rheumatoid arthritis. **Results:** The prevalence of thyroid disorder among RA factor positive patients were 9(18%). Most of the cases were subclinical hypothyroidism, i.e. 5(10.0%) and Hyperthyroidism cases were 3(6.%) cases. And only one hypothyroidism case was found in this study. **Conclusion:** Thyroid dysfunction is found to be very common in people with RA, according to our findings. Based on our findings, it is proposed that screening for thyroid autoantibodies and thyroid dysfunction should be included in the care and follow-up of RA patients.

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INTRODUCTION

Rheumatoid arthritis (RA) is a chronic and systemic autoimmune disease that causes persistent inflammatory polyarthritis and joint degradation, limiting mobility and increasing disability.[1] The frequency of RA in the general population is about 1%, and it has been linked to a number of co-morbidities.[2] The aetiology of RA is still unknown, and both genetic and environmental variables have a role in the disease's development.[3] Despite the clinical implications of RA, patients with the condition are more likely to develop co-morbidities, such as cardiovascular disease (CVD).[4] The mechanism underlying the higher risk of co-morbidities in RA patients is unknown, but researchers tend to blame it on the disease's inflammatory state.[5] Hyperthyroidism and hypothyroidism are the most common forms of thyroid malfunction. Overt and subclinical stages of hyperthyroidism and hypothyroidism can be distinguished.[6] Graves' disease (GD) is the most common cause of hyperthyroidism, which is defined by an excess of thyroid hormones. Insufficiency of thyroid hormones is hypothyroidism, and Hashimoto's thyroiditis is the most prevalent cause (HT). Hyperthyroidism and hypothyroidism both have a negative influence on human health and can increase the risk of cardiovascular disease and death. Thyroid dysfunction was found to be common in RA patients in previous research, with frequency ranging from 6 to 34 percent.[7] Thyroid function testing is frequently advised for people who have symptoms including cold intolerance, weight loss, high metabolism, or thyroid goitre.[8] Furthermore, some guidelines recommend that individuals with type 1 diabetes or Addison's disease have thyroid-related testing because

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they are at a higher risk of thyroid malfunction.[9] In RA patients, however, a typical thyroid function test is not indicated. Thyroid dysfunction is a concern that has yet to be thoroughly proven in RA patients. In this study, we used a case-control design to assess the prevalence and risk of thyroid dysfunction in RA patients. To fully clarify the link between RA and thyroid dysfunction, a systematic review and meta-analysis were done.

METHODS

A total of 50 RA patients were recruited from the Outpatient and Inpatient departments of Medicine at Phulo Jhano Medical College over a one-year period. The American Rheumatology Association classification standards were used to examine all of the patients.[10] Individuals with a history of other rheumatic disorders were among those who were excluded. In addition, a thorough examination was carried out, with a focus on thyroid dysfunction symptoms and test markers. All patients signed a written informed consent form. Those that took part were all from the Dumka community. By age and sex, five or ten non-RA controls were matched to one RA patient. Sexe, age, disease duration, treatment techniques, C-reactive protein (CRP), rheumatoid factor (RF), anti-cyclic citrullinated peptide antibody (anti-CCP), and other factors were all gathered. Co-morbidities like hypertension and type 2 diabetes mellitus (T2DM) were also recorded. In addition, the levels of free triiodothyronine (FT3), free thyroxine (FT4), and circulating thyroid stimulating hormone (TSH) were measured, as well as ultrasound examination and/or diffuse goitre. Thyroid dysfunction was defined as hyperthyroidism (clinical or subclinical) or hypothyroidism based on a combination of thyroid hormones and clinical symptoms (clinical or subclinical). Subclinical hyperthyroidism was described as a lowered TSH level with a normal FT4 level, whereas overt hyperthyroidism was classified as a decreased TSH level with an elevated FT4 level. Overt hypothyroidism was described as having a high TSH level and a low FT4 level, whereas subclinical hypothyroidism (SCH) was defined as having a high TSH level but a normal FT4 level. TSH, FT, and FT4 had reference values of 0.27–4.2 mIU/L, 3.1–6.8 pmol/L, and 12.0–22.0 pmol/L, respectively. SPSS was used to examine all of the data (version 23.0). The Chi-square test was used to examine the difference in sex, hypertension, and T2DM between RA patients and controls, and the t-test was used to establish the difference in age. The Chi-square test was used to assess the frequency of thyroid dysfunction in RA patients and controls; a p Value<0.05 was considered statistically significant.

RESULTS

Table 1: Characteristic among study population.

Variable		RA (*n* = 50)
Age (mean ± SD)		55.23±4.12
Sex	(Male, %)	4(8.0%)
	(Female, %)	46(92.0%)
Hypertension		11 (22.0%)
Type 2 diabetes		5 (10.0%)
RA duration		6.45 ± 5.21

The mean age of our study participants was 55.23 Years. Female were predominantly higher than male cases. And we have found 11(22%) cases had hypertension and 5(10.0%) patients had diabetes mellitus, and Duration of the disease was 6.45 Years.

Table 2: The prevalence of thyroid dysfunction and its subgroup in RA patients.

	RA patients (*n* = 50)
Thyroid dysfunction	9 (18.0%)
Hyperthyroidism	3 (6.0%)
Hypothyroidism	1 (2.0%)
Subclinical hypothyroidism	5 (10.0%)

The prevalence of thyroid disorder among RA factor positive patients were 9(18%). Most of the cases were subclinical hypothyroidism, i.e. 5(10.0%) and Hyperthyroidism cases were 3(6.%) cases. And only one hypothyroidism case was found in this study.

Table 3: Mean and SD value of Thyroid dysfunction

	n=9	FT3	FT4	TSH
Hyperthyroidism	3 (6.0%)	5.22±2.10	15.24±2.11	0.021±0.01
Hypothyroidism	1 (2.0%)	0.45±0.00	0.96±000	17.24±0.00
Subclinical hypothyroidism	5 (10.0%)	3.45±0.56	1.22±0.23	6.45±1.32

DISCUSSION

Thyroid dysfunction was more common in individuals with RA than in patients without RA in our study, especially primary hypothyroidism and subclinical hypothyroidism. Thyroid dysfunction was also found in 18% of RA patients. Our findings were comparable to those of other studies. Thyroid dysfunction was shown to be more common in RA patients (32.3 percent) than in controls, according to Li *et al.*[1] However, in our study, which only found a considerable incidence of hypothyroidism, both hyperthyroidism and subclinical hypothyroidism were much more frequent in the RA group. Primary hypothyroidism was shown to be the most frequent thyroid malfunction in RA patients, followed by subclinical hypothyroidism, according to Elattar *et al.*[11] Other research has also found a link between RA and thyroid antibodies. When RA patients were compared to the control group, Andonopoulos *et al.* found a difference in the amount of thyroid autoantibodies.[12] Thyroid autoantibodies are substantially more prevalent in RA patients than in the general population, according to Acay *et al.*[13] Thyroid disease and rheumatoid arthritis are both autoimmune diseases, thus their origins could be comparable. The actual mechanism, however, is still unknown. The link between RA and thyroid dysfunction is thought to be mediated by hereditary and environmental factors.[14] Thyroid function should be assessed in people with RA since RA medication can aggravate thyroid abnormalities. High dosages of glucocorticoids, which are commonly used to treat inflammation in RA patients, can cause direct inhibition of TSH secretion without raising FT3 or FT4.[15] Thyroid function may also be affected by another medication, leflunomide.[14] As a result, several studies have proposed that thyroid screening should be done routinely in RA patients.[16] To the best of our knowledge, this is the first study to look at the link between RA and thyroid function in a local setting. The study, however, contains the following flaws. The sample size was quite small because the study was conducted in a single institute. Second, thyroid hormones were only assessed at the time of enrollment, not during the disease. As a result, we don't know how rheumatoid arthritis affects the thyroid over time. Third, the effect of thyroid dysfunction on RA treatment was not looked into.

CONCLUSION

In conclusion, our findings show that RA patients have a higher prevalence of thyroid dysfunction, and RA is a significant risk factor for thyroid dysfunction. Thyroid dysfunction, particularly overt hypothyroidism, is more common in RA patients. As a result, this research proposes that thyroid-related diagnostics, such as thyroid autoantibodies and thyroid function tests, should be included more frequently in the evaluation of RA patients, and that more research into the mechanisms behind the link between RA and thyroid dysfunction is needed.

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