

The prevalence of thyroid dysfunction in patients with connective tissue disorders



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Submission: 16-02-2021

Revision: 29-05-2021

Publication: 01-07-2021

ABSTRACT

Background: Abnormalities in thyroid function have been reported in patients with connective tissue disorders. In India many patients suffer from thyroid dysfunction and rheumatological disorders. There is a lack of awareness of thyroid dysfunction in patients suffering from connective tissue disorders. Also, studies regarding the same are lacking in India. **Aims and Objective:** The current study was undertaken to estimate the Prevalence of Thyroid dysfunction in connective tissue disorders. **Materials and Methods:** It's a duration based, prospective cross-sectional study including 100 patients. Patients presenting with connective tissue disorders were evaluated for thyroid function clinically and were subjected to serum TSH, Free T3, Free T4 and Anti-thyroid antibodies. The association was analyzed using frequency analysis, percentage analysis, and Chi-Square test. **Results:** Of the 100 patients in this study, predilection of connective tissue disorders was seen among females. The overall prevalence of thyroid dysfunction in patients with connective tissue disorder was 41%. 22% of the 100 patients had Anti-TPO antibodies suggestive of autoimmune thyroiditis. Our study showed 42.1% of the patients with rheumatoid arthritis, 45.5% of the patients with Systemic Lupus Erythematosus, 50% of the patients with Sjogren's syndrome, 27.3% of the patients with Systemic sclerosis, and 42.9% of the patients with mixed connective tissue disorder had thyroid dysfunction. **Conclusion:** Our study demonstrates the increased prevalence of thyroid dysfunction among patients with connective tissue disorders and shows a female preponderance, in the age group of 45-65 years. Hence, early screening and intervention will prevent significant morbidity and improve the quality of patients' life.

Key words: Connective tissue disorder; Thyroid dysfunction; Hypothyroidism; Subclinical hypothyroidism; Hyperthyroidism; Systemic lupus erythematosus; Scleroderma; Sjogren's syndrome; Rheumatoid arthritis; Vasculitis

INTRODUCTION

In patients with connective tissue disorder, the global prevalence of chronic autoimmune thyroiditis is found to be higher than the general population.¹

Thyroid dysfunction in connective tissue disorders is marked by the presence of antibodies against the Thyroid antigen.¹

Abnormalities in thyroid function and the presence of thyroid autoantibodies have been reported by various authors in patients with connective tissue disorders such as

Systemic lupus erythematosus (SLE), Rheumatoid arthritis (RA), Sjogren's syndrome, Scleroderma and vasculitides.²

Patients have frequently shown changes in the circulating thyroid hormone levels such as low total T3 or Free T3 (fT3), low or normal levels of total T4, elevated levels of free T4 (fT4), normal or subnormal levels of circulating concentrations of thyroid stimulating hormone (TSH).¹

In a country like India where many patients suffer from rheumatological disorders, there is a lack of awareness of

Access this article online

Website:

<http://nepjol.info/index.php/AJMS>

DOI: 10.3126/ajms.v12i7.34998

E-ISSN: 2091-0576

P-ISSN: 2467-9100

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thyroid dysfunction in patients suffering from connective tissue disorders.

Also, studies on thyroid dysfunction in patients suffering from connective tissue disorders are lacking in India. Hence, this study is undertaken to estimate the “Prevalence of Thyroid dysfunction in connective tissue disorders” so that early detection and intervention will prevent significant morbidity.

MATERIALS AND METHODS

It is a duration based, prospective cross-sectional study including 100 patients above the age of 16 years who attended the Outpatient Department and the patients admitted in the Department of General Medicine of Vydehi Institute of Medical Sciences and Research Center during the period from January 2017 to April 2018. The study was pre-approved by the Institutional Ethics Committee (IEC) for the final permission. After obtaining the permission of IEC the study was conducted.

A detailed history comprising of the symptoms and signs of thyroid disorder was taken for patients presenting with connective tissue disorders and a thorough General physical examination, head to toe examination with vitals, and systemic examination was done. All the patients in addition to clinical assessment were subjected to Serum TSH, Free T3, Free T4, Anti-thyroid Peroxidase antibodies using chemiluminescent immunoassay (CLIA) system. Patients already diagnosed with Connective Tissue disorders such as Systemic lupus erythematosus, scleroderma, Sjogren's syndrome, Rheumatoid arthritis, Vasculitis were included in the study. The patients excluded in the study were those with primary thyroid disorder, those who have undergone thyroidectomy or thyroid surgeries, those who have had irradiation of thyroid gland or pregnant women.

Statistical analysis

Statistical analysis was carried out for 100 patients with various connective tissue disorders.

The association was analyzed using frequency analysis, percentage analysis and Chi-Square test.

Microsoft Excel 2013 and SPSS (Statistical Package for Social Sciences) Version 22.0 software was used for data entry and analysis.

RESULTS

In this study of 100 patients with various connective tissue disorders, the greatest number of patients belonged

between the age group of 16 - 44 years which accounted for 66% of the cases. The number of patients between the age group of 45-65 years of age was 33% and the number of patients above 66 years was 1% of the cases (Table 1).

The incidence of connective tissue disorder in this study was found to be 3.76 higher in females than in males.

Among the 100 patients with connective tissue disorder, 27% had subclinical hypothyroidism, 13% had hypothyroidism and 1% hyperthyroidism and 22% had Anti- TPO antibodies. The overall prevalence of thyroid dysfunction was 41% (Table 2).

In our study, among the 57 patients with Rheumatoid Arthritis, 63% patients had subclinical hypothyroidism and 53.8% patients had clinical hypothyroidism. (p- value <0.01). Among the 22 patients with SLE, 18.5% patients had subclinical hypothyroidism, 38.5% patients had clinical hypothyroidism. (p- value <0.01). Among the 7 patients with MCTD, 7.4% patients had subclinical hypothyroidism, 7.7% patients had clinical hypothyroidism. (p- value <0.01). Of the 11 patients with Systemic sclerosis, 27.3% patients had subclinical hypothyroidism. (p- value <0.01). Amongst the patients with Sjogrens syndrome and Takayasu's arteritis no patient had thyroid dysfunction (p- value <0.01) (Table 3).

DISCUSSION

In our study of the 100 patients with various connective tissue disorders, the most common age group to be affected

Table 1: Sex distribution across the age category

Age	Sex					
	Female		Male		Total	
	Count	%	Count	%	Count	%
≤ 44	57	72.2%	9	42.9%	66	66.0%
45-65	21	26.6%	12	57.1%	33	33.0%
≥ 66	1	1.3%	0	0.0%	1	1.0%
Total	79	100.0%	21	100.0%	100	100.0%

Table 2: Prevalence of thyroid dysfunction in connective tissue disorders

Thyroid dysfunction	Frequency	Percent	Anti- TPO antibodies
Negative	59	59.0	04
Subclinical Hypothyroidism	27	27.0	05
Hyperthyroidism	01	1.0	00
Hypothyroidism	13	13.0	13
Subclinical Hypothyroidism	0	0	00
Hyperthyroidism			
Total	100	100.0	22

Table 3 : Prevalence of thyroid dysfunction in various connective tissue disorders

Connective Tissue Disorder	Thyroid dysfunction								Total	
	Negative		Sub clinical hypothyroidism		Hyperthyroidism		Hypothyroidism			
	Count	%	Count	%	Count	%	Count	%	Count	%
RA	33	57.9%	17	29.8%	0	0.0%	7	12.3%	57	100.0%
SLE	12	54.5%	5	22.7%	0	0.0%	5	22.7%	22	100.0%
Systemic Sclerosis	8	72.7%	3	27.3%	0	0.0%	0	0.0%	11	100.0%
MCTD	4	57.1%	2	28.6%	0	0.0%	1	14.3%	7	100.0%
Sjogrens	1	50.0%	0	0.0%	1	50.0%	0	0.0%	2	100.0%
Takayasu's Arteritis	1	100.0%	0	0.0%	0	0.0%	0	0.0%	1	100.0%
Total	60	60.0%	27	27.0%	1	1.0%	13	13.0%	100	100.0%

Chi-square value=38.45; Df=15; P value<0.01**

was between 16- 44 years of age, which accounted for 66% of the cases. Similar to studies done by Kosaraju K et al and M. Gaubitz where the common age group affected was between 15- 40 years.^{3,4}

The predilection of females having connective tissue disorder in our study was 3.76 times more compared to males which was similar to a study done by Jacqueline et al in which the female predilection varied between 2:1 to 9:1 compared to males in various connective tissue disorders.⁵

Our study showed 41% of the 100 patients with connective tissue disorders had thyroid dysfunction, similar to a study done by Jaring et al where out of 155 patients with connective tissue disorders, 21.94% patient had thyroid dysfunction.⁶

In a study by Irena⁷ et al Anti-TPO antibodies were found in 20 out 90 patients that is 22% which is similar to our study where Anti-TPO antibodies were found in 22% of the patients with thyroid dysfunction, which is suggestive of autoimmune thyroiditis among the patients with connective tissue disorders.

42.1% of the patients with rheumatoid arthritis had thyroid dysfunction in our study. Similar results were found in studies done by Jeffery et al⁸ and Nadeem et al⁹ which showed 30% and 41.8% thyroid dysfunction respectively among the patients with Rheumatoid arthritis.

Our study showed 45.5% of patients with Systemic Lupus Erythematosus had thyroid dysfunction. This increase in the thyroid dysfunction in patients with SLE was also shown in studies by Viggiano¹⁰ and Kakehasi.¹¹

In our study 50% patients with Sjogren's syndrome had thyroid dysfunction similar to studies by Rasmus et al¹² and D' Arbonneaunet¹³ al where incidence of thyroid dysfunction among patients with Sjogren's syndrome was found to be 36% and 30% respectively.

27.3% patients with Systemic sclerosis had thyroid dysfunction in our study. Studies done by Gordon et al¹⁴, and Innocencio¹⁵ also showed 14% and 52% of systemic sclerosis patients respectively had thyroid dysfunction.

In our study, the patient with vasculitis had normal thyroid function. Whereas, In a study by Prendecki, of 275 patients with vasculitis, thyroid disorder was seen in 21.5% of the patients.¹⁶ Another study by Englund et al, showed thyroid disorder in 14.5% of the 186 patients with vasculitis.¹⁷

Our study showed 42.9% of patients with mixed connective tissue disorder had thyroid dysfunction which was similar to a study by Biro et al in which 24% of the patients with mixed connective tissue disorder had thyroid dysfunction.¹⁸

CONCLUSION

The conclusion of our study is congruent to multiple previous studies, which demonstrates the increased prevalence of thyroid dysfunction among patients with connective tissue disorders and shows a female preponderance, in the age group of 45-65 years. Hence, early screening and intervention will prevent significant morbidity and improve the quality of patients' life.

ACKNOWLEDGMENT

The authors wish to show their appreciation to the Department of General medicine of Vydehi Institute of Medical Sciences and Research Centre, Whitefield, Karnataka for their whole hearted support during this study.

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Author's Contribution:

DJ: Concept and design of the study; Data acquisition, prepared first and final draft of manuscript; **JC:** Concept and design of study, Coordination, Manuscript editing, Manuscript review; **SH:** Literature search, Statistical analysis, Manuscript editing, Manuscript review; **AS:** Literature search, Data analysis, Manuscript editing, Manuscript review; **CK:** Literature search, Data acquisition, Manuscript editing; **SA:** Literature search, Data acquisition, Manuscript editing; **EM:** Literature search, Data acquisition, Manuscript editing; **SV:** Literature search, Data acquisition, Manuscript editing.

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Source of funding: None, **Conflict of Interest:** None.