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A Study on Prevalence of Subclinical Hypothyroidism in Systemic Sclerosis Patients

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I. Background

Systemic sclerosis is a rare connective tissue disorder, with multisystem involvement, progressive course , significant morbidity and premature death The association of Systemic Sclerosis with thyroid fibrosis, hypothyroidism and thyroid autoimmunity has been variably reported.Systemic Sclerosis is an autoimmune disease and expected to be associated with other autoimmune phenomena, and also thyroid immune dysfunction. Thyroid dysfunction in Systemic sclerosis may be explained on many lines such as production of auto-antibodies and cell-mediated immune response with consequent thyroid gland involvement, and cannot be limited only to gland fibrosis. Subclinical Hypothyroidism has been associated with dyslipidaemia, coronary and carotid atherosclerosis, increased risk of MI, left ventricular systolic dysfunction and Heart failure. Thus early detection and treatment in a progressive auto-immune disease like systemic sclerosis can reduce the morbidity from disorders related to subclinical hypothyroidism and increase survival in them.

Objectives

1. To evaluate the prevalence of subclinical hypothyroidism in systemic sclerosis patients
2. For early detection of subclinical hypothyroidism and early initiation of thyroid replacement therapy

II. Materials And Methods

This study is to be conducted among 50 patients both new and old cases of systemic sclerosis, visiting Rheumatology department inGovernment Rajaji Hospital, Madurai. Institutional ethical committee approval was obtained. Informed and written consent was obtained from each patient before included in the study.

Inclusion criteria

- Patients diagnosed with systemic sclerosis based on ACR/EULAR Criteria
- Age- 20-50 years
- Gender – Both male and female (female>male)
- Patients without significant cardiac illness and treatment for the same

Exclusion criteria

- Age > 50 years
- Patients with overt hypothyroidism
- Patients on drugs that may influence thyroid functions
- Patients with H/O cardiac illness / stroke and treatment for the same
- Patients with prominent visceral organ involvement of manifest Systemic Sclerosis

Data collection

Data will be collected using a pretested proforma meeting the objectives of the study.Patients are selected for study who satisfied all inclusion and exclusion criteria. Relevant history including symptoms and signs during study, past medical history, drug history and examination findings are to be noted in detail.Patients

in study group are tested for subclinical hypothyroidism in the presence of autoimmunity. The prevalence of subclinical hypothyroidism in diffuse systemic sclerosis and limited cutaneous systemic sclerosis, dyslipidemia, cardiac status of the study group based on ECG, ECHO are to be studied.

Laboratory investigations:

- Complete blood count, includes TC, DC, Haemoglobin % , platelet count, ESR,PCV
- Renal function test, includes blood urea, serum creatinine.
- Serum total protein and Urine routine to find proteinuria
- Fasting lipid profile to document dyslipidemia
- Thyroid function tests including TSH, free T4, free T3, Anti-TPO antibody TFT methodology:
- Ultrasonogram of thyroid gland
- ECG and ECHO
- **DESIGN OF STUDY:**
- Cross sectional study
- **PERIOD OF STUDY:**
- 6 MONTHS
- **COLLABORATING DEPARTMENTS:**
- Department of Cardiology, Biochemistry,Endocrinology,Radiology
- **ETHICAL CLEARANCE**: Obtained
- **CONSENT**: Individualwritten and informed consent.
- **ANALYSIS**: The collected data will be entered in Microsoft Excel spreadsheet and analyzed using Statistical Package for Social Sciences (SPSS) version 17
- **CONFLICT OF INTEREST**: NIL
- **FINANCIAL SUPPORT**: SELF

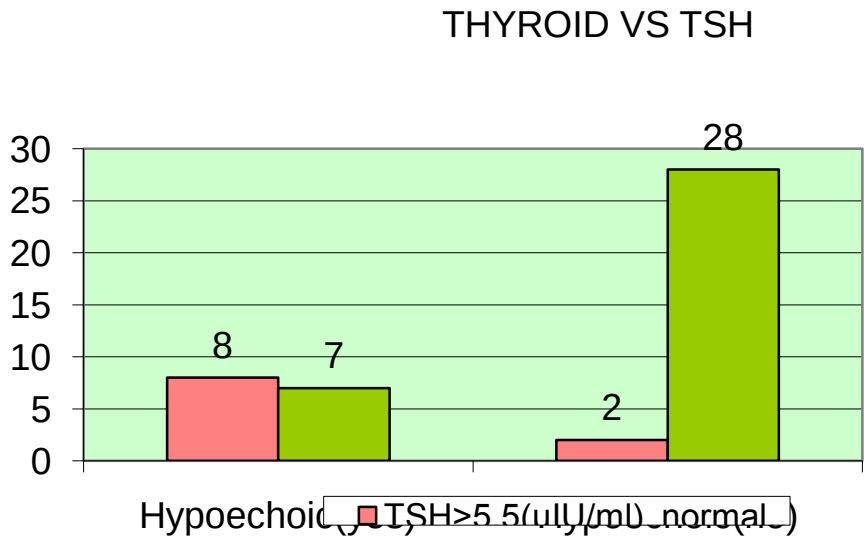
III. Results

Table 12: comparison of autoimmunity and thyroid pattern in SSC patients

	TSH>5.5(µIU/ml), normal T3,T4	Normal TFT
AbTPO(>10IU/ml)	6	5
AbTPO(<10IU/ml)	4	30
Hypoechoic(yes)	8	7
Hypoechoic(no)	2	28

Comment:

Composite table on autoimmunity and USG thyroid findings with 6 of SCH and 5 of Euthyroid were AbTP



LIMITATION:

The number of involved in study is less since SSc is a rare disease which has made some of the study results statistically insignificant. Further this study is a cross-sectional study to calculate the prevalence rather than a prospectively followed observational study which would have yielded much information on follow up.

If so, the reversal of morbidity predicting risk factors like dyslipidemia, proteinuria would have been positively studied following treatment .

IV. Discussion

Thyroid dysfunction in Systemic sclerosis may be explained on many lines such as production of auto-antibodies and cell-mediated immune response with consequent thyroid gland involvement, and cannot be limited only to gland fibrosis[21'22]. Out of 50 people in study population 5 were in age limit < 30 years, 29 were between 30-50 years and 16 were more than 50 years ,in accordance with that described in literature.[24]

Combining autoimmunity and USG thyroid findings 6 of SCH and 5 of Euthyroid were AbTPO positive and 8 of SCH and 7 of Euthyroid population showed hypoechoic thyroid.Autoimmune phenomenon is a marked feature of patients with SSc (1–6). Percentage of the antithyroid antibodies ranged from 12 to 52% in different studies (8–19). Comparing the distribution of SCH and thyroiditis suggested by AbTPO and hypoechoic thyroid and low thyroid volume (<6 ml) in the absence of SCH is positive in 9 of DCSSc and 3 of LCSSc. 10/50 (20%) patients among cases had SCH , almost comparable to 17% by Antenolli*et al.*[3] and 17.7% by Marasini*et al.*[23] and contrasts with others.[26] These results agree closely with those reported by a population-based survey so far in the literature (35), which showed a 8% prevalence for subclinical hypothyroidism in females over the age of 40 years (36).comparing the morbidity predicting risk factors in SSc patient with SCH shows ECG changes insignificant. Otherwise Dyslipidemia, proteinuria and ECG changes are statistically significant when compared to Euthyroid population.

V. Conclusion

The results of study involving 50 SSc in a teritiary care centre like GovernmentRajaji hospital, Madurai demonstrate a significantly higher prevalence of AbTPO, ultrasonographic findings of thyroid autoimmunity, and subclinical hypothyroidism. The early diagnosis of thyroid dysfunction in SSc may have an important impact also on the clinical manifestations of SSc, it has been found that, Raynaud's phenomenon is more difficult to control in hypothyroid individuals and pulmonary hypertension can be drastically influenced by hemodynamic changes of hypothyroidism. Thus Thyroid function Test and ultrasonography should be tested as a part of the clinical profiling of SSc patients, along with anti- thyroid antibodies. Those who are at a higher risk (females, positive AbTPO, hypoechoic and small thyroid volume) should have thyroid function follow-up and appropriate treatment immediately after diagnosis, since the morbidity predictind risk factors are proved to be reversed following thyroxine replacement in studies.

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