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The Association of Systemic Lupus Erythematosus with Autoimmune Hypothyroidism

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Abstract **Original Research Article**

Background: It's fairly uncommon for one autoimmune illness to coexist with another. Systemic lupus erythematosus (SLE) and underactive thyroid are two of the most frequent autoimmune disorders. They could have some kind of connection. ***Objective:*** In this study our main goal is to evaluate the association of Systemic Lupus Erythematosus with Autoimmune Hypothyroidism. ***Method:*** This cross sectional study was carried out tertiary hospital Bangladesh from June 2021 to June 2022. A total of 100 randomly selected indoor and outdoor SLE patients of both sexes and different age groups were enrolled for the study (Group-1). Total 100, age and sex matched healthy controls without SLE (Group-2) was selected for comparison. Verbal consent was taken from both group and ethical clearance was obtained from local ethical committee. ***Results:*** During the study, 21-25 years age group, 31% and 95% were female. In group-1 45% had hypothyroidism, followed by 35% had subclinical hypothyroidism, 35% had enlarged thyroid gland. Whereas in group-2 26% had hypothyroidism, followed by 55% had subclinical hypothyroidism. In Group-1 m hemolytic anemia 25%, ITP 21%, APS 20%, Type I DM 9%, MCTD 8%, RA 5%, Dermatomyositis- Polymyositis 6%, Grave's Disease 4% and miscellaneous 2%. Whereas in case of Coexisting non-immunologic diseases cushingoid 30%, PUD 6%, CKD 6, dyslipidemia 21%, osteoporosis 5%, hepatitis 2%, IHD 4%, CVD 2%. ***Conclusion:*** There was no conclusive proof that SLE caused autoimmune hypothyroidism. The clinical presentation of these disorders is likewise similar. This means that all SLE patients may benefit from having a thyroid screening test performed to check for autoimmune hypothyroidism. It is important to look for any autoimmune disorders that may be present and treat any comorbidity found. All of these things are important to think about while choosing a treatment for SLE and improving its management.

Keywords: Systemic Lupus Erythematosus (SLE), Autoimmune Hypothyroidism, Thyroid.

INTRODUCTION

Autoimmune disorders outnumber all others combined by a wide margin [1]. Rheumatoid arthritis, SLE, Ankylosing spondylitis, Systemic sclerosis, Dermatomyositis, vasculitides, Hashimoto's thyroiditis, graves' disease, type 1 diabetes, addison's disease, psoriasis, pemphigus vulgaris, lichen planus, alopecia areata, vitiligo, multiple sclerosis, myasthenia gravis [2]. They may have a variety of causes, including genetics, epigenetics, the environment, or be idiopathic (no known cause). In families, they tend to cluster because of shared causes [3]. Third, it is common for many autoimmune disorders to coexist in a single patient. There are shared and overlapping clinical characteristics in closely connected autoimmune disorders. For complete and efficient care, it is crucial to recognize the presence of comorbid autoimmune illnesses and other co-morbidities. Hypothyroidism and systemic lupus erythematosus (SLE) are both autoimmune illnesses that have been linked to each other [4-6]. In this respect, there are a number of reports of studies in international journals. The problem is that there aren't many opportunities to study in Bangladesh.

OBJECTIVE

In this study our main goal is to evaluate the association of Systemic Lupus Erythematosus with Autoimmune Hypothyroidism.

METHODOLOGY

This cross sectional study was carried out tertiary hospital Bangladesh from June 2021 to June 2022. A total of 100 randomly selected indoor and outdoor SLE patients of both sexes and different age groups were enrolled for the study (Group-1). Total 100, age and sex matched healthy controls without SLE (Group-2) was selected for comparison. Verbal consent was taken from both group and ethical clearance was obtained from local ethical committee. Group-1 patients were examined and tested to see the co-existing auto-immune hypothyroidism and other autoimmune diseases and non-immunological co-morbid diseases. The Group-2 was screened for presence of autoimmune hypothyroidism. Data were collected in preplanned and predesigned forms from face to face interview, clinical history, physical examination, relevant investigations and old documents. Data were plotted in tables and charts and analyzed in computer SPSS version 16. The results were verified and compared with other study reports. The results of Group-1 and 2 were also compared. Chi square test was done to see the level of significance.

RESULTS

Table-1 shows demographic distribution of the patients where 21-25 years age group, 31%. Followed by 26% belong to >15-20 years age group, 18% belong to 26-30 years age group. Plus, 95% were female.

Table-1: Demographic distribution of the patients

Demographic group	**%**
>15-20 years	26%
21-25 years	31%
26-30 years	18%
31-35 years	16%
>36 years	9%
Gender	**%**
Male	5%
Female	95%

Table-2 shows Thyroid function of group-1 where 45% had hypothyroidism, followed by 35% had subclinical hypothyroidism, 35% had enlarged thyroid gland.

Table-2: Thyroid function of group-1

Thyroid function status	**Group-1, %**
Hypothyroidism	45%
Subclinical hypothyroidism	35%
Euthyroid with auto antibody positive	20%
Thyroid Gland status	**%**
Normal	65%
Enlarged	35%

Table-3 shows Thyroid function status in Group-2 where 26% had hypothyroidism, followed by 55% had subclinical hypothyroidism.

Table-3: Thyroid function of group-2

Thyroid function status	**Group-1, %**
Hypothyroidism	26%
Subclinical hypothyroidism	55%
Euthyroid with auto antibody positive	19%

Table-4 shows autoimmune and non-immunologic disease associations in Group-1 m hemolytic anemia 25%, ITP 21%, APS 20%, Type I DM 9%, MCTD 8%, RA 5%, Dermatomyositis-Polymyositis 6%, Grave's Disease 4% and miscellaneous 2%. Whereas in case of Coexisting non-immunologic diseases cushingoid 30%, PUD 6%, CKD 6, dyslipidemia 21%, osteoporosis 5%, hepatitis 2%, IHD 4%, CVD 2%.

Table-4: Autoimmune and non-immunologic disease associations

Autoimmune Diseases	**%**
Autoimmune hemolytic anemia	25%
ITP	21%
APS	20%
DM-1	9%
MCTD	8%
Dermatomyositis/Polymyositis	6%
RA	5%
Grave diseases	4%
Miscellaneous	2%
Non-immunologic Diseases	**%**
Cushingoid	30%
CKD	21%
Dyslipidemia	13%
DM-2	9%
HTN	8%
PUD	6%
Osteoporosis	5%
IHD	4%
Hepatitis	2%
CVD	2%

DISCUSSION

SLE is a multisystem autoimmune disease mainly affecting the females in their reproductive age. Average longevity of SLE patients is reduced by 15 years. Mortality is mainly due to cardiovascular, renal and neurologic complications and infections due to immunosuppression produced by disease and drugs [7, 8]. Fetomaternal complications are worth mentioning. Hypothyroidism also has got adverse metabolic and cardiovascular effects like dyslipidemia, atherosclerosis, hypertension and IHD. Fetomaternal complications like subfertility, recurrent abortion, menorrhagia etc are common in hypothyroidism [9, 10]. If hypothyroidism co-exists with SLE the diagnosis may be difficult because of similar and overlapping symptoms. Cumulative effects of both conditions will produce more complication and fatality [11].

In this study we have found that 95% of SLE is female and majority belongs to reproductive age group like 21- 30 and 31-40 years. It is a widely accepted and proved fact that 90% of SLE patients are female; the percentage increasing in reproductive age [11]. We have found that out of 100 SLE cases 45% had hypothyroidism, followed by 35% had subclinical hypothyroidism. Weetman and Walport compared the prevalence of ThyAb and abnormal thyroid- stimulating hormone (TSH) levels in 41 SLE patients, versus age- and sex-matched controls. A significant higher prevalence of ThyAb (51%) was observed in SLE compared to (27%) controls. Furthermore, hypothyroidism was observed in 10 (25%) SLE patients and 5 controls, usually in association with circulating ThyAb [12].

Other coexisting autoimmune diseases like hemolytic anemia 25%, ITP 21%, APS 20%, Type I DM 9%, MCTD 8%, RA 5%, Dermatomyositis-Polymyositis 6%, Grave's Disease 4% and miscellaneous 2% were found in our study. McDonagh JE and Isenberg DA reported in a study that 65 out of 215 patients (30%) had one or more autoimmune disease in addition to SLE, 51(24%) having one AID, 12 (6%) having two AID and two (1%) having three AID[13]. There is no time limit on when a second (or even third) overlapping autoimmune disease may develop, although it is most likely to happen shortly after the first diagnosis. Nevertheless, it is still possible to develop a second autoimmune disease more than ten years after the diagnosis of the first [14].

Most common non-immunologic comorbidity was cushingoid 30%, PUD 6%, CKD 6, dyslipidemia 21%, osteoporosis 5%, hepatitis 2%, IHD 4%, CVD 2%. An article on the Lupus Foundation of America states that although lupus usually occurs alone, people with lupus may experience symptoms typical of one or more other connective tissue diseases. In these cases, a physician may use the term "overlap" to describe the illness. Common diseases that overlap with lupus include Autoimmune thyroid disease, Celiac disease, Myasthenia gravis, Antiphospholipid syndrome, Rheumatoid arthritis, Polymyositis, Dermatomyositis, Scleroderma and Sjögren's syndrome14.Among healthy control only 1% had hypothyroidism, 2% had subclinical hypothyroidism, 1% had thyroid autoantibody in euthyroid state. A retrospective study by Donald S. A. McLeod and David S. Cooper revealed that less than <5% healthy individuals had hypothyroidism or subclinical hypothyroidism [14]. In group A patients the number of autoimmune

hypothyroidism, subclinical hypothyroidism and thyroid autoantibody were much more in number compared to controls (Group-2). The differences were statistically not significant (p >0.01).

CONCLUSION

There was no conclusive proof that SLE caused autoimmune hypothyroidism. The clinical presentation of these disorders is likewise similar. This means that all SLE patients may benefit from having a thyroid screening test performed to check for autoimmune hypothyroidism. It is important to look for any autoimmune disorders that may be present and treat any comorbidity found. All of these things are important to think about while choosing a treatment for SLE and improving its management.

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