Original Article

Association of Systemic Lupus Erythematosus with Autoimmune Hypothyroidism

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Abstract

Introduction: Autoimmune disease has got tendency to co-exist with another autoimmune disease. SLE and hypothyroidism are common autoimmune diseases. They may be associated with each other.

Objectives: To find the association of SLE and Autoimmune Hypothyroidism.

Materials and Methods: This prospective case control study was conducted in the department of Rheumatology, CMH Dhaka from January 2017 to June 2019. Total 100 cases of SLE (Group A) were included in the study to see the presence of co-existing autoimmune hypothyroidism. Another 100 age and sex matched healthy controls without SLE (Group B) were screened for hypothyroidism. Verbal consent was taken and ethical issue was addressed. Data were collected in a pre-planned and pre-designed form after face to face interview, clinical history, physical examination and relevant laboratory investigations and plotted in tables and charts. Data were analyzed in computer SPSS Version 16. Chi-square test was done to see the level of significance.

Results: Total 100 SLE patients were enrolled in this study (Group A). Age range was from 14-65. Amongst them 96 were females and only 4 were males. Majority of them belonged to 20-30 and 31-40 years age group and frequency were 40 (40%) and 35 (35%) respectively. Out of 100 SLE cases 8 patients had coexisting autoimmune hypothyroidism, 6 patients had subclinical hypothyroidism and another 4 had thyroid autoantibody with biochemically euthyroid state. Amongst the control group only 1 had hypothyroidism, 2 had subclinical hypothyroidism and 1 had thyroid autoantibody with biochemically euthyroid state. The differences in two groups were statistically significant.

Conclusion: There is a strong positive association between SLE and autoimmune hypothyroidism. There are also overlapping clinical manifestations in these conditions. Therefore, thyroid screening test may be done in every case of SLE for early detection of autoimmune hypothyroidism to effectively manage both diseases.

Key-words: SLE, Autoimmune disease, Hypothyroidism, Thyroid autoantibody, Co-morbidity

Introduction

There are more than 100 autoimmune diseases. Some common autoimmune diseases are Rheumatoid Arthritis, SLE, Ankylosing Spondylitis, Systemic Sclerosis, Dermatomyositis, Vasculitides, Hashimoto's Thyroiditis, Grave's Disease, Type I DM, Addison's Disease, Psoriasis, Pemphigus Vulgaris, Lichen Planus, Alopecia Areata, Vitiligo, Multiple Sclerosis, Myasthenia Gravis, GBS, IBD, Autoimmune Hepatitis, Primary Biliary Cirrhosis, Autoimmune Hemolytic Anemia, ITP, anti GBM antibody (Goodpasture's Syndrome), Pernicious Anemia etc[1,2]. They have genetic, epigenetic, environmental and idiopathic etiology. They have got tendency to clustering in family members due to common etiologic factors[3]. One autoimmune disease has the tendency to co-exist with another in individual patient also. There are common and overlapping clinical features in closely linked autoimmune diseases. Therefore, it is essential to identify co-existing autoimmune diseases and other co-morbidities for total and effective management[4,5]. SLE and hypothyroidism are two common autoimmune disorders and have association with each other[6]. There are multiple study reports in international journals in this regard. But the number of study is very less and limited in Bangladesh. The present study is aimed to establish the relationship of SLE and autoimmune hypothyroidism.

Materials and Methods

This prospective case control study was carried out in the department of Rheumatology, CMH Dhaka during the period from January 2017 to June 2019. Total 100 randomly selected indoor and outdoor SLE patients of both sexes and different age groups were enrolled for the study (Group A). Total 100, age and sex matched healthy controls without SLE (Group B) were selected for comparison. Verbal consent was taken from both group and ethical clearance was obtained from local ethical committee. Group A 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 B were 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 A and B were also compared. Chi square test was done to see the level of significance.

Results

Total 100 SLE patients were enrolled in this study (Group A). Out of them 96 were female and only 4 were male. Age ranged from 14 to 65 years among them 5 patients were <20 years, 38 were 21-30 years, 34 were 31-40 years, 16 were 41-50 years and 7 were >50 years age group (Table-I). In Group A, 8 patients had autoimmune hypothyroidism, 6 had subclinical hypothyroidism and 4 had thyroid autoantibody with euthyroid state. All these 18 cases had either anti TG or anti TPO or both antibodies, 6 of them had goiter and 12 of them without goiter (Table-II). In Group A other coexisting auto-immune diseases were present in 37 patients

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among them hemolytic anemia 7, ITP 6, APS 5, Type I DM 3, MCTD 3, RA 2, Dermatomyositis-Polymyositis 2, Grave's Disease 1 and miscellaneous 8. Coexisting non-immunologic diseases were present in 59 patient, among them cushingoid 10, PUD 5, CKD 6, dyslipidemia 6, osteoporosis 5, hepatitis 4, IHD 4, CVD 3 and others 6 (Table-III). In Group B, the number of autoimmune hypothyroidism was 1, subclinical hypothyroidism were 2 and thyroid autoantibody with euthyroid state in 1 individual (Table-IV). Table-V shows the comparison of autoimmune hypothyroidism in Group A and B. Hypothyroidism 8 vs 1, subclinical hypothyroidism 6 vs 2 and euthyroid state with positive thyroid autoantibody 4 vs 1. All the differences were statistically not significant (p>0.05). Therefore, from this study it is not clear that there is a association between SLE and autoimmune hypothyroidism. All the 18 cases had either anti TG or anti TPO or both antibodies.

Table-I: Age and sex distribution of SLE cases (n=100)

		Frequency	Percentage
Age in years	<20	5	5
	21-30	38	38
	31-40	34	34
	41-50	16	16
	>50	7	7
Sex	Male	4	4
	Female	96	96

Table-II: Thyroid function and gland status in Group A (n=18)

Characteristics		Frequency	Percentage
Thyroid function status	Hypothyroidism	8	44.5
	Subclinical hypothyroidism	6	33.3
	Euthyroid with auto antibody positive	4	22.2
Thyroid gland status	Normal size	12	66.7
	Enlarged	6	33.3

Table-III: Autoimmune and non-immunologic disease associations in Group A (n=100)

Diseases association		Frequency	Percentage
Autoimmune Diseases	Autoimmune hemolytic anemia	7	7
	ITP	6	6
	APS	5	5
	Type I DM	3	3
	MCTD	3	3
	Dermatomyositis/Polymyositis	2	2
	RA	2	2
	Grave's Disease	1	1
	Miscellaneous	8	8
	Total	37	37
Non-immunologic Diseases	Cushingoid	10	10
	CKD	6	6
	Dyslipidemia	6	6
	Type 2 DM	5	5
	HTN	5	5
	PUD	5	5
	Osteoporosis	5	5
	IHD	4	4
	Hepatitis	4	4
	CVD	3	3
	Others	6	6
	Total	59	59

Table-IV: Thyroid function status in Group B (n=4)

Characteristics		Frequency	Percentage
Thyroid function status	Hypothyroidism	1	25
	Subclinical hypothyroidism	2	50
	Euthyroid with auto antibody positive	1	25

Table-V: Comparison of thyroid status in Group A and B

Thyroid status	Group A	Group B	Statistics
Hypothyroidism	8	1	$\chi2 = 0.564$ df = 2 p >0.05
Subclinical hypothyroidism	6	2	
Euthyroid with auto antibody positive	4	1	
Total	18	4	

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 96% of SLE are 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 8 (8%) had autoimmune 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 autoimmune hemolytic anemia (7%), ITP (6%), APS (5%), Type I DM (3%), MCTD (3%), RA (2%), Dermatomyositis (1%), Polymyositis (1%), Grave's Disease (1%) 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 iatrogenic Cushing's (10%). Other diseases were CKD (6%), dyslipidemia (6%), type 2 DM (5%), HTN (5%), PUD (5%), osteoporosis (5%), IHD (4%), hepatitis (3%) and CVD (3%). 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 syndrome[14].

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 B). The differences were statistically not significant (p >0.01).

Conclusion

There was no clear cut positive association between SLE and autoimmune hypothyroidism. There are also overlapping clinical manifestations in these conditions. Therefore, thyroid screening test may be done in every case of SLE for early detection of autoimmune hypothyroidism for early and effective management of both diseases. Other co-existing autoimmune diseases should be searched, and co-morbidities should be identified and addressed accordingly. All these should be taken into consideration for selection of medicine and better management of SLE.

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