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Thyroid Dysfunction andThyroid Autoantibodies in Egyptian Patients with Systemic Lupus Erythematosus (SLE)

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ABSTRACT

Background: Systemic lupus erythematosus (SLE) is a systemic autoimmune disease with many clinical manifestations and immunological abnormalities. SLE and autoimmune thyroid disease are at the two endpoints of a shared immunogenetic mechanism. **Aim of the study**: To evaluate the link between SLE and thyroid disorders. **Patients and Methods**: Thirtypatients known to have SLE were recruited in this study, with ageranged from 17 to 35 years. All patients were submitted to history taking, clinical examination, and relevant laboratory investigation. **Results**: Thyroid disorderswere common (33.3%) in lupus patients. Hypothyroidism was the commonest (16.6%) abnormality in SLE patients then euthyroid (10.0%), and lastly hyperthyroidism (6.6%). The mean age of SLE patients was 26.1±1.5 year. Eighty percent ofthe patientswere females. The most common SLEcharacteristics were malar flush (90.0%), photosenstivity (80.0%), fever (70.0%), and arthritis (50.0%). Mean Hb level was 9.2±0.59 g/dL. While, mean values of acute phase reactants were erythrocyte sedmentaion rate (ESR) at 1st and 2nd hour (74.3±6.6 and 121.4±5.26 mm/h, respectively) and C-reactive protein (20±6.7 mg/L). The meansof FT_3, FT_4, TSH, TG Ab, and anti thyroperoxidase (TPO) Abin SLE patiets were 136.6±14.1 ng/dL, 8.83±1.2 ng/dL, 4.15±1.27ng/dL, 15.12±11.15ng/dL, and 121±65.4 IU/mL, respectively. Meanwhile, 30.0% and 76.7% of SLE patients were +ve for rheumatoid factor (RF) and antineuclearAb, respectively. There were 6.7% and 16.7% of the patients +ve for thyroglobulin Ab and anti TPO Ab, respectively. The statistically significant differences parameters in SLE patients with normal and abnormal thyroid function were ESR at 1 & 2 hours, RF, and antiTPO Ab (P=0.00, 0.00, 0.03, and 0.03, respectively). The statistically significant differences parameters of demographic, clinical, and laboratory data in SLE patients with normal and subgroups of abnormal thyroid function were age, SLE duration, Hb level, RBC, WBC, PLT, and ESR at 1 & 2 hours (P=0.00, 0.00, 0.00, 0.001, 0.0001, 0.00, 0.00, and 0.00, respectively). **Conclusion and Recommendation**: Thyroid disordersare common in SLE patients. The most common form is hypothyrodism. Patients with SLE should be evaluated for thyroid disorders by testing FT_3, FT_4, TSH, TG Ab, and anti PO Abfor early detection of thyroid abnormalities. Further studies are needed to support and clarify the association between SLE and thyroid disorders.

Key words: Systemic lupus erythromatosus**,** Clinicalmanifistations, Thyroid dysfunction.

INTRODUCTION

Autoimmune diseases can be divided into organ-specific and systemic illness. The systemic inflammatory autoimmune diseases are such as systemic lupus erythromatosus (SLE), rheumatoid arthritis (RA), etc [1]. SLE is prevalent throughout the world with manifold clinical manifestations and immunological abnormalities. SLE is affecting primarily women [2]. Its incidence varies from 40-100 per 1, 00,000 populatio [3]. Also,thyroid disorders are quite common. They are the next common to type 2 diabetes mellitus among the various endocrine disorders [4]. Many studies had showed the prevalence of thyroid disorders in SLE [5,6]. SLE Patients had a high prevalence of symptomatic and significantly more subclinical hypothyroidism and positive thyroid autoantibodies. Thyroid autoantibodies may precede the appearance of clinical autoimmune disease [7]. Also, thyroiditis is very common in SLE [8]. Hashimoto's disease (HD) is the most important autoimmune cause of thyroiditis all over the world. The patients often present with hypothyroidism and a firm goiter. It is the most common cause of goitrous hypothyroidism in areas of iodine sufficiency [9]. Thyroiditis and consequent hypothyroidism can be the first manifestation of a variety of autoimmune diseases such as Sjogren's syndrome, Scleroderma and SLE [6]. **Pyne and Isenberg** [10] showed that patients with SLE had a prevalence of hypothyroidism greater than that of the normal population. The presence of either condition was associated with a higher frequency of both antimicrosomal and anti-thyroglobulin antibodies (anti TG Abs).

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Infections were among the main complications of SLE [11].

The mechanism for autoimmune destruction of the thyroid probably involves both cellular immunity and humoral immunity. Lymphocytic infiltration of the thyroid gland by B cells and cytotoxic T cells is a common histologic feature of all forms of autoimmune thyroiditis. Autoimmune thyroiditis is linked to HLA-DR 3,4,5 that are also linked to SLE [8].

Various rheumatologic manifestations such as arthritis, joint swelling, muscle pain, and swelling are common in hypothyroidism particularly in patients with HD. Also, thyroiditis is often associated with other auto-immune diseases such as SLE, RA, etc [12]. Further, thyroid function abnormalities and thyroid autoantibodies have been frequently described in patients with rheumatologic autoimmune diseases, such as RA, SLE, and scleroderma [13].

SLE is often associated with thyroiditis features and hypothyroidism. On the other hand, patients of hypothyroidism with rheumato-logical symptoms may have other auto-immune disease such as SLE and RA in addition [5]. Result of a metaanalysis suggests that thyroid autoimmunity is more prevalent in patients with SLE than in acontrol group [14]. Also, subclinical hypothyroidism is significantly higher among SLE patients than in healthy controls [15]. The screening for SLE can perhaps help us in identifying the etiology of hypothyroidism in a substantial proportion of cases, especially in the presence of significant goiter [1].

Aim of the work

The aim of this work is to assess the thyroid function and thyroid autoantibodies in Egyptian patients with SLE in Assiut Governorate.

PATIENTS AND METHODS

Adescriptive, analytical study desiegn was used to investigate the present research problem. Anapproval was taken to conduct the present study from the Councils of the Departments of the Internal Medicine and the Rheumatology, Physical Medicine & Rehabilitation, Al-Azhar University, Assuit, Egypt. Also, theMedical Ethics Committee of Al-Azhar Faculty of Medicine, Assuit, Egypt has approved protocol of the study. The study was conducted on thirty patients with SLE attending the Outpatient Clinics of the Internal Medicine and the Rheumatology, Physical Medicine & Rehabilitation, Al-Azhar University Hospital at Assiut. The patients were seeking for medical advice or follow up. All patients were known to have SLE. Aim of the study and procedures that will be done were explained to the patients. All patients accepted to participate in the study and an informal consent was taken from each of them. The study was done during period from October 2014 to February 2015.

The patientswere subjected to the following:

A. Determine their demographic characterististics.

B. Full history taking; personal, present, past, and family history.

C. Full clinical examination; general, local, and other systems examination.

D. Laboratory investigations:

1- Erthrocyte sedmentaion rate (ESR) at 1 & 2 hours and C-reactive protein (CRP) (using latex method for both of them).

2- Complete blood count (CBC) using cell counter.

3- Rheumatoid factor (RF) using ELISA (IU/mL).

4- Thyroid function tests; free T_3 (ng/dL), free T_4 (µg/dL), and TSH (µIU/mL) using Cobas method.

5- Thyroid antibodies tests: Thyroglobulin antibodies (TG Ab, µIU/mL) and anti thyro-peroxidase (anti TPOAb IU/mL) using Cobas method.

6- Antineuclear antibodies (ANA, using ELISA, IU/mL).

Exclusion criteria

A- The patients who already has thyrotoxic graves disease.

B- The patients who are under steroid medication.

Statistical analysis

Analysis of data was done by computer using Epi-info, software, version 6.04. The data were presented in 7 tables and one figure. Tabulated data were presented as frequency distribution and percentage, range, and arithmetic mean (M) ±standard deviation (SD). Student's t-test (testing the statistical significance difference between two means± SD of two samples) and F-test (analysis of variance, ANOVA) testing the statistical significance of difference between three Ms ± SD of three groups) were used. Chi-square (χ^2) test or Fisher Exact (FE) test (they testing for the statistical significant relation between different variables' grades in quantitative data or percentages). If

the obtained P-value of the t-test, F-test, χ^2, and FE were ≤0.05; so the difference between the groups wasconsidered significantand if it was >0.05; the difference between the groups was considered insignificant.

RESULTS

Table (**1**) shows the demographic and clinical data of patients with systemic lupus erythematosus. Age of the patients ranged from 17 to 37 years, with mean 26.1±1.5. As regard to sex, 24 (80.0%) were females and 6 (20.0%) were males. Mean duration of the disease was 12.8±2.6 month. Lastly, table (**1**) and figure (1) clear that the most common characteristics of SLE features were malar flush (90.0%), photosenstivity (80.0%), fever (70.0%), and arthritis (50.0%).

Table (1): Demographic and clinical data of patients with systemic lupus erythematosus (SLE)

Variables	SLE patients (N=30)
	N (%) or (M± SD)
Age (years)	
Range	17 – 37
Mean ± SD	26.1 ± 1.5
Sex	
Male	6 (20.0%)
Female	24 (80.0%)
Disease duration time (Mean±SD month)	12.8 ±2.6
Characteristic (complaint) features of SLE	
Malar flush	27 (90.0%)
Photosensitivity	24 (80.0%)
Arthritis	15 (50.0%)
Discoid lupus	11 (36.7%)
Oral ulceration	9 (30.0%)
Serositis	9 (30%)
Fever	21 (70.0%)
Renal disorders	14 (46.7%)

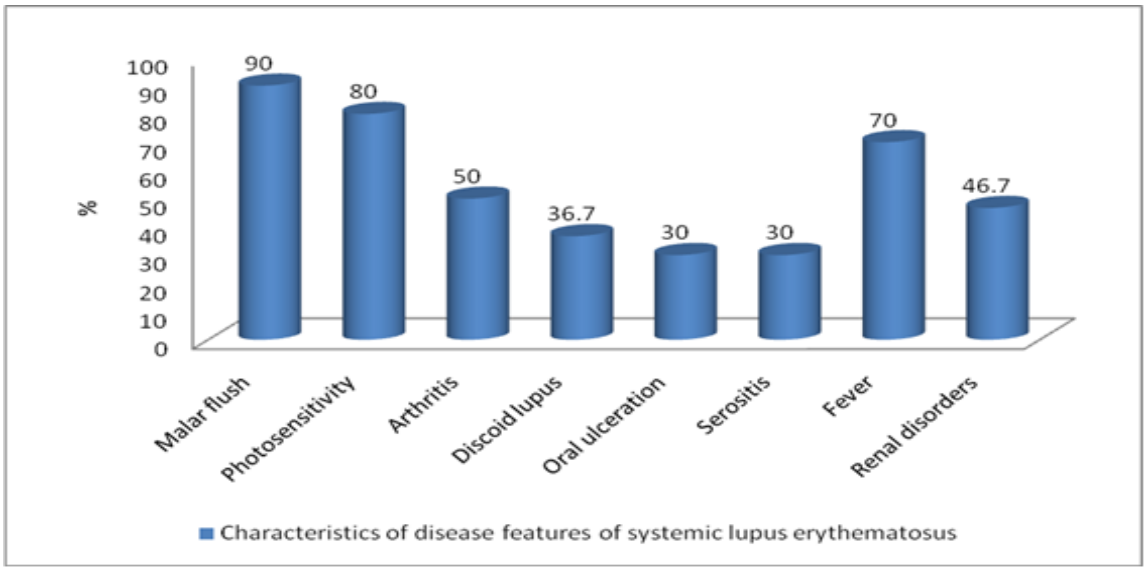

Figure (1): Characteristic of the disease features of the systemic lupus erythematosus

Table (2): Peripheral hemogramand acute phase reactantsinpatients with systemic lupus erythematosus (SLE)

Laboratory variables	SLE(N=30)
Red blood corpuscles (RBCs) 10^{12}/dL (mean ± SD)	3.35 ± 0.19
White blood cells (WBCs) 10^{9}/dL (mean ± SD)	5.69 ± 0.81
Platlets (PLT) 10^{9}/dL (mean ± SD)	273 ± 25.4
Hemoglobin (Hb) g/dL (mean ± SD)	9.2 ± 0.59
Erythrocyte sedmintation rate (ESR)1hour mm/h (mean ± SD)	74.3 ± 6.63
ESR2hours mm/h (mean ± SD)	121.4 ± 5.26
C-reactive protein (CRP) mg/L (mean ± SD)	20 ± 6.7

Table (**2**) clears the peripheral hemogram and acute phase reactants in patients with SLE. All mean values of peripheral hemogram are normal except hemoglobulin level was below normal (9.2 ± 0.59 g/dL). On the other hand allmean values of acute phase reactants are above normal; ESR at 1st and 2nd hour (74.3 ± 6.6 and 121.4 ± 5.26 mm/h, respectively) and CRP(20 ± 6.7 mg/L).

Table (3): Thyroid function test values in patients with Systemiclupus erythematosus (SLE)

Thyroid function test (normal range)	No. of observed	Range of observed values	Mean ± SD
F T_3 (82-179ng/dL)	30	41.9-277	136.6 ± 14.1
F T_4 (4.5-12.5 µg/dL)	30	0.8-18.3	8.83 ± 1.2
TSH (0.4-4 µIU/mL)	30	0.01-21	4.15 ± 1.27
TG Ab(2-50 ng/mL)	30	0.0-255.7	15.12 ± 11.15
Anti TPO[Anti thyro-peroxidase]Ab(up to35IU/mL)	30	0.5-1001	121 ± 65.4

Table (**3**) illustrates the thyroid function test values in patients with SLE. The table shows that range and mean± SD values of free T_3 in all patiets are between 41.9 and 277ng/dL and mean of 136.6±14.1, free T_4 in all patiets between 0.8 and 18.3ng/dL and mean of 8.83±1.2, TSH in all patiets between 0.01 and 21ng/dL and mean of 4.15±1.27, TG Ab in all patiets between 0.0 and 255.7ng/dL and mean of 15.12±11.15, and Anti TPO Ab in all patiets between 0.5 and 1001 IU/mL and mean of 121±65.4.

Table (4): Positive RF, ANA,and thyroid auto-antibodies results in patients with systemic lupus erythematosus (SLE)

Variables	SLE (N=30)	
	No.	%
Rheumatoid factor (RF)	9	30.0
Anti nuclear antibody (ANA)	23	76.7
Thyroglobulin (TG) Ab	2	6.7
Anti thyro-peroxidase (TPO)Ab	5	16.7

Table (**4**) clarifies that 30.0% and 76.7% of SLE patients are positive for RF and ANA, respectively. Also, there are 6.7% and 16.7% of the patients' positive for TG Ab andanti TPO Ab, respectively.

Table (5): Results of thyroid function test in subgroups of patientswithsystemic lupus erythematosus (SLE)

Thyroid function subgroups	SLE (N=30)	
	No.	%
Normal thyroid function test	20	66.7
Abnormal thyroid function test	10	33.3
Subclinical hypothyroidism (normal FT_3, FT_4 increased)	3	10.0
Biochemical hypothyroidism (normal or decreased FT_3 decreased FT_4 normal TSH)	2	6.6
Euthroid sick syndrome (decreased FT_3 normal or decreased FT_4 normal TSH)	3	10.0
Biochemical hyperthyroidism (increased FT_3, FT_4 and decreased TSH)	1	3.3
Subclinical hyperthyroidism (normal FT_3 , FT_4 and decreased TSH)	1	3.3

Table (**5**) reports distribution of the patients with SLE according to results of the thyroid function test. These subgroups are; normal thyroid function' group, 20 (66.7%) patients and abnormal thyroid function' group, 10 (33.3%) patients. The patients in the abnormal thyroid function group were 3 (10.0%) subclincal hypothyroidisim, 2 (6.6%) biochemical hypothyroidisim, 3 (10.0%) euthyroid sick syndrome, 1 (3.3%) subclincalhyperthyroidisim, and 1 (3.3%) biochemical hyperthyroidisim.

Table (6): Parameters ofdemographic, clinical, and laboratory data in patients with systemic lupus erythematosus (SLE) with normal and abnormal thyroid function

Parameters	Normal thyroid function	Abnormal thyroid function	FE t-test	P-value
	N=20	N=10		
	N (%) or (M± SD)	N (%) or (M± SD)		
Sex:				
Female	16 (80.0%)	8 (80.0%)		
Male	4 (20.0%)	2 (20.0%)	FE	1.0
Age (mean ± SD years)	37.5 ±2.39	30.2±3.81	5.539	0.999
SLE duration (mean ± SD month)	14.0 ± 2.21	4.9±2.23	10.568	1.0
Hemoglobin (g/ dL)	11.37±0.49	11.1±2.34	0.361	0.64
RBC 10^{12} dL	4.12±0.162	4.3±1.3	-0.436	0.337
WBC 10^9 /dL	7.4 ± 0.66	5.7±1.72	3.016	0.992
PLT 10^9 dL	330.7±22.3	257.1±40.4	5.367	0.999
ESR 1 mm/h	76.5± 6.55	116.3±11.34	-10.275	0.000
ESR 2 mm/h	100.8±5.15	137.6±8.4	12.71	0.000
RF	3 (15.0%)	6 (60.0%)	FE	0.03
ANA	13 (65.0%)	10 (100.0%)	FE	0.06
TG Ab	1 (5.0%)	1 (10.0%)	FE	1.0
AntiTPO Ab	1 (5.0%)	4 (40.0%)	FE	0.03

Table (**6**) clears different parameters of demographic, clinical, and laboratory data in SLE patients with normal and abnormal thyroid function. ESR at 1 & 2 hours, RF, and anti TPO Ab were the only labporatory results that showed statistically significant differences (P=0.00, 0.00, 0.03, and 0.03, respectively). On the other hand, the differences between SLE patients with- and without thyroid function test results; sex, age, duration of SLE, Hb, perephralhemogram, ANA, and TG Ab were statistically insignificant.

Table (7): Different parameters of demographic, clinical, and laboratory data in systemic lupus erythematosus (SLE) patients with normal and subgroups of abnormal thyroid function

Parameters	Normal thyroid function	Hypo-thyroidism	Euthyroid syndrome	Hyper-thyroidism	*χ^2 **F-test	P-value
	N=20	N=5	N=3	2		
	N (%) or (M± SD)	N (%) or (M± SD)	N (%) or (M± SD)	N (%) or (M± SD)		
Sex:						
Female	16 (80.0%)	4 (80.0%)	2 (66.7%)	2 (100.0%)		
Male	4 (20.0%)	1 (20.0%)	1 (33.3%)	0 (0.0%)	0.833	0.841
Age (years)	37.5 ±2.39	29.6±4.18	29.75±4.3	30.8±0.3	15.634	0.000001
SLE duration/month	14.0 ± 2.21	5.6±2.62	3.1±1.0	7.2±2.8	36.094	0.000
Hemoglobin (g/ dL)	11.37±0.49	13.4±1.63	7.87±1.12	12.47±2.16	23.12	0.000
RBC 10^{12} dL	4.12±0.162	3.7±1.1	2.75±0.41	4.1 ± 0.9	6.964	0.001
WBC 10^9 /dL	7.4 ± 0.66	7.4±1.28	4.8±1.02	6.2±0.8	9.724	0.0001
PLT 10^9 dL	330.7±22.3	263.1±47.9	267.7±42.68	224.3±29.4	14.669	0.000001
ESR 1 mm/h	76.5± 6.55	101.2±9.56	123.7±10.87	53.1±15.7	48.142	0.000
ESR 2 mm/h	100.8±5.15	126.8±7.9	140.2±7.53	88.4±27.2	36.035	0.000
RF	3(15.0%)	3 (60.0%)	2 (50%)	1 (50%)	1.534	0.674
ANA	13 (65.0%)	5 (100.0%)	3 (100%)	2 (100%)	4.565	0.206
TG Ab	1 (5.0%)	1 (20.0%)	0 (0.0%)	0 (0.0%)	1.875	0.598
Anti TPOAb	1 (5.0%)	2 (40.0%)	1 (33.3%)	1 (50.0%)	6.12	0.1

Table (**7**) clarifies different parameters of demographic, clinical, and laboratory data in SLE patients with normal and subgroups of abnormal thyroid function. Age, SLE duration, Hb level, RBC, WBC, PLT, and ESR at 1 & 2 hours are the demographic, clinical, and labporatory results that showed statistically significant differences (P=0.00, 0.00, 0.00, 0.001, 0.0001, 0.00, 0.00, and 0.00, respectively). On the other hand, the differences between SLE patients without- and the subgroups with thyroid function test results; sex, RF, ANA, TG Ab, and anti TPO Ab were statistically insignificant.

DISCUSSION

The present work was conducted to study the thyroid dysfunction in SLE patients. Thirty patients from Internal Medicine and Rheumatology Departments known to have SLE were included in the study, their ages ranged between 17 and 37 years and the mean age was 26.1±1.5 year. Most (80.0%) of the patients were females. Our result regarding age is consistent with **Pradhan *et al.*** [16]; they found that SLE was diagnosed in age group 21-30 years. Also, **Zimmermann *et al.*** [17] cleared that at diagnosis, 24% of their SLE patients were under 20 years, 63% were between 20 and 40 years, and 13% were older than 40 years. Further, according to **Tunbridge *et al.*** [18], the prevalence of subclinical hypothyroidism in females above the age of 18 was 7.5% and clinical hypothyroidism was 1%. Also, among 749 recorded cases of SLE during the period from 1989 to 2006. The average age at SLE onset was approximately 30.66 years [11]. Further, 100 patients with SLE, seen at the Department of Internal Medicine in Tunisia over a period between 1987 and 2001; the average age at the onset of disease was 32 year. Nineteen (19%) patients were aged over 50 years at the time of SLE diagnosis (late-onset SLE) [19].

As regard sex, SLE is an autoimmune disease affecting primarily women [2]. Our finding is agreement with **Houman *et al.*** [19]; they noticed that women were 92% and men8%. Also, **Khanfir *et al.*** [11] showedthatwomen were 90.3% and men were 9.7%, with an average age at SLE onset of approximately 30.66 years. Further, **Alarfaj *et al.*** [20] found that females were 90.7% among SLE patients' diagnosedwith a mean age of 34.3±11.9 year and range 8-71 years.

At the same time, mean SLE duration was 9.3±5.3 year and range from 0.3 to 30 years [20]. Our short mean duration may be due to small number of our patients (30) compared with 624 patients in the study of **Alarfaj *et al.*** [20]. Also, it may be due to neglecance of our SLE

patients in seeking medical advice due to socio-cultural and economic factors.

Regarding the most common characteristics of SLE features, they were malar flush (90.0%), photosenstivity (80.0%), fever (70.0%), arthritis (50.0%), and serositis (30.0%). **Borchers *et al*.** [2] stated that SLE is a systemic autoimmune disease with manifold clinical manifestations and immunological abnormalities. Our results were similar to **Houman *et al*.** [19]; they observed that among their SLE patients: 78% had articular-involvement, 53% photosensitivity, 63%malar rash, and 45% had serositis. Also, **Khanfir *et al*.** [11] showed that SLE patients were characterized by a high frequency of photosensitivity (67.6%), malar rash (68.7%), and renalinvolvement (49.5%). Further, they reported that nephritis was diagnosed in 43% of their cases and consisted always of glomerular nephritis, in three cases of which tubule-interstitial lesions were also observed [19]. Also, neurologic involvement had prevalence from 8% to 32% of the patients according to their ethnicity. Serositis was present from 21% to 51% of the the patients according to their ethnicity. Vasculitis had an increased prevalence of 50% [17].

Considering hematological character-istics of SLE patients; we noticed that their mean Hb level (9.2±0.59 g/dL) was below normal value. Haematological abnormalities are common in SLE patients [21]. Anemia is a common clinical finding in patients with SLE [22]. It is found in about 50.0% of SLE patients [21]. Further, anemia (Hb<12 gm/dL) occurred in 63% of patients [20]. Impaired erythropoietin response and presence of antibodies against erythropoietin may contribute to the patho-genesis of this type of anemia [21]. In more details, **Alarfaj *et al*.** [20] found that 82.7% of SLE patients had hematological abnormalities at the time of diagnosis. WBC (<4 $\times 10^9$/L) was present in 30%, lymphopenia (>1.5$\times 10^9$/L) in 40.3%, and platelets (<100$\times 10^9$/L) in 10.9%.

In the current study, we illustratedthat the mean values of acute phase reactants were high; ESR at 1st and 2nd hour and CRP. These results may be due to that most of our cases had activity during time of the study. Also, SLE is a systemic inflammatory autoimmune disease as RA [1].

Regarding thyroid function test results in patients with SLE; our data showed that the mean± SD values of FT_3 in all patietswas 136.6±14.1 ng/dL, FT_4 was 8.83±1.2 ng/dL, TSH was 4.15±1.27 ng/dL, TG Abwas 15.12±11.15 ng/dL, and anti TPO Ab in all patiets was 121±65.4 IU/mL. Thyroid dys-function is frequent in SLE patients [23]. Since symptoms of SLE and thyroid disease can be similar, so SLE patients should be routinely investigated for autoimmune thyroid disease [7].

El-Sherif *et al*. [24] showed that anti TPO Ab was found in 15% of SLE patients and 10% of controls. Also, anti TG Ab was found in 5% of SLE patients and 10% of controls.

Paul *et al*. [1] showed that among the patients diagnosed with hypothyroidism and SLE, anti TPO Ab was positive in 72.7% (P=0.037). Also, they found 68.7% of patients with only SLE had anti TPO Ab positive, which was statistically significant (P<0.05). Further, **Kohno *et al*.** [25] found, in Japan, comparable results. However, these antibodies in SLE were often not thyroid specific [1]. Monoclonal anti TPO Abs in these cases cross-react with lactoperoxidase, this is similar to human peroxidases such as TPO, neutrophil peroxidase, uterine peroxidase or myeloperoxidase [25]. So, anti-TPO does not always correlate with the presence of thyroiditis in SLE [1].

In the current study, we clarified that 30.0% and 76.7% of SLE patients were positive for RF and ANA, respectively. Also, 6.7% and 16.7% of SLE patients were positive for TG Ab and anti TPO Ab, respectively. One of the most common organs to be affected by organ-specific autoimmune injury is the thyroid gland. Whether concomitant organ-specific and systemic autoimmune diseases occur more often by chance than expected is a controversial issue. In particular, a large body of conflicting data has accumulated concerning the relationship between SLE and thyroid disease. Many studies and case reports have associated SLE with hypothyroidism, both subclinical and clinical forms [1]. Positive RF was found significantly (P=0.04) more frequently foundin SLE patients with autoimmune thyroid disease when compared with SLE patients without auto-immune thyroid disease **Appenzeller *et al.*** [7]. Anti nuclear antibodies (ANA) can be positive in a variety of conditions. It is also found in autoimmune thyroiditis [26]. Further, ANA was present in all cases with SLE [16]. Immunological features included ANA was observed in 100% of the patients [19]. Also, ANA was present in 98.0% of SLE patients [17].

In this study, we reporteddistribution of the patients with SLE according to theirthyroid

dysfunction and thyroid function test results, 33.3% of SLE patientshad abnormal thyroid function. Our result was lower than **El-Sherif *et al.*** [24]; they reported a high (50%) prevalence of thyroid disorders in SLE patients. On the other hand, our result was higher than thatof **Zakeri and Sandooghi** [27]; they showed that24.1% prevalence of thyroid disorders.

Our patients in the thyroid dysfunction group were 10.0% subclincal hypo-thyroidisim, 6.6% biochemical hypothyroidisim, 10.0% euthyroid sick syndrome, 3.3% subclincal hyperthyroidisim, and 3.3% biochemical hyper-thyroidisim. The occurrence of hypothyroidism is common in SLE, a large body of data has support this [1]. Further, the presence of thyroid disorders is often correlated with SLEDAI (SLE disease activity index) [3]. Our results were comparable to **El-Sherif *et al.*** [24]; they observed that in their SLE group; 20% had hypo-thyroidism (10% subclinical and 10% bio-chemical), 20% had euthyroid sick syndrome, and 10% had hyperthyroidism (5% subclinical and 5% biochemical).Variable results were reported in many studies; prevalence of hypothyroidism and hyperthyroidism ranging from 3.9% to 39% and 0.0% to 10.9%, respectively [5, 1028,29]. These wide variations could be contributed to different sensitivities of the assay methods, the sample size included in the different studies, or racial prevalence of thyroid disease among the studied groups **El-Sherif *et al.*** [24]. Also, **Chan *et al.*** [30] noticed that 4.3% of their SLE patients had clinical hypothyroidism. **Mader *et al.*** [31] as well, cleared that 11.6% of their SLE patients had clinical hypothyroid compared to 1.9% in the control group.

Pyne and Isenberg [10] showed that prevalence of hypothyroidism in their SLE cohort was higher (5.7%) than in the normal population (1%), while that of hyperthyroidism (1.7%) was not significantly different.

Further, **Pan *et al.*** [14] cleared that 14% of the SLE cohort had thyroid antibodies, rising to 68% in the subgroup who also had thyroid disease (P<0.001). Both antimicrosomal and anti TGAbs were detected. The antibodies were found in equally high frequency in the hyperthyroid subgroup (80% of patients), whereas in the hypothyroid subgroup antimicrosomal antibodies were more frequent than anti TGAbs (64% vs 41%). There was no significant difference in the frequency with which antimicrosomal or ant TG Abs were detected between the hyperthyroid and hypothyroid subgroups (P>0.2).

Also, **Miller *et al.*** [32] has noted a significantly higher than expected prevalence of hypothyroidism (6.6%) in SLE patients. Further, **ElSegai *et al.*** [15] reportedthat the overall thyroid dysfunction among SLE patients was 32.5% vs 12.6% in the control group (P<0.002). The most prevalent thyroid dysfunction in SLE patients was subclinical hypothyroidism, 23.25% of patients whereas, in the control group subclinical hypothyroidism was present in 8.0% of patients, (P<0.002). On the other hand, although subclinical hyperthyroidism was statistically insignificant in patients (9.3%) vs the corresponding group in control (4.7%), P> 0.05), and serum FT_4 was within the reference range, it was significantly higher than in control (P<0.01). **Appenzeller *et al.*** [7] reported that symptomatic autoimmune thyroid disease was observed in 6.1% of SLE patients and in 2% of controls (P>0.05), predominantly hypo-thyroidism 5.3% in SLE patients vs 2% in controls. Subclinical thyroid disease was identified in 11.5% and positive thyroid autoantibodies in the absence of thyroid disease in 17% of SLE patients. Thyroid autoantibodies preceded the occurrence of clinical autoimmune thyroid disease in 70% of SLE patients.

Disease activity of the SLE was correlated significantly with the presence of symptoms of hyperthyroidism [7].

CONCLUSION AND RECOMMENDATION

Thyroid disorders are common in SLE patients. The most common form is hypothyrodism. Patients with SLE should be evaluated for thyroid disorder by testing FT_3, FT_4, TSH, TG Ab, and anti TPO Ab for early detection of thyroid abnormalities. Further studies on large number of patients are needed to support and clarify the association between SLE and thyroid disorders in Egypt.

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