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Research Article

ASSESSMENT IMPORTANCE OF IL4, C3 AND C4 IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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ABSTRACT

Systemic lupus erythematosus (SLE) is an autoimmune disease and a chronic systematic disease with unknown etiology influential more than one million individuals each year. The aim of this study is to substantiation the impact of IL4, C3 and C4 in patients with Systemic Lupus Erythematosus. During the period 2/January/2013 to 1/October/2013, fifty patients with Systemic Lupus Erythematosus that diagnosed by clinic specialists at female with ages ranged between (8-65) years, by using ANA indirect Immunofluorescence test, anti-dsDNA ELISA kit , C3,C4 Radial Immunodiffusion Plate , IL4 ELISA kit. There was an elevated levels of the parameters; ANA, anti-dsDNA and IL-4 that measured in SLE patients which reflect the severity of disease comparing with controls group, also there was importance of ANA, anti-dsDNA, C3, C4 and IL4 in the predictions of disease activity.
Keywords: ANA, anti-dsDNA, C3, C4, IL4 and SLE.

INTRODUCTION

Systemic lupus erythematosus (SLE) is an autoimmune disease and a chronic systematic disease with unknown etiology influential more than one million individuals each year (1).

Systemic lupus erythematosus (SLE) is a systemic autoimmune disease which is characterized by a paucity of tolerance to nuclear antigens and various immunological aberration, including irregular activation of both T and B lymphocytes and subsequent polyclonal activation of circulating B lymphocytes which produces a large quantity of autoantibodies and the formation of immune complexes causing tissue damage (2).

Increased apoptotic neutrophils are found in SLE, related to disease activity and levels of anti-dsDNA antibody that induce apoptosis. The increased apoptosis mechanisms is not clear (3). The complement system plays a major role in the systemic lupus erythematosus (SLE). However, the role of complement in SLE is complex since it may both prevent and monuments the disease (4).

SLE appears clinical involvement offensive of the joints, skin, kidney, brain, lung, heart, serosa and gastrointestinal tract (5).

It is currently believed that the SLE is triggered by various environmental factors in genetically susceptible individuals. Various environmental agents and toxicants, such as cigarette smoke, alcohol, occupationally- and non-occupationally-related chemicals, infections, ultraviolet light ,sex hormones and certain medications and vaccines, have been implicated to induce SLE and very few randomized controlled trials (6).

SLE has amelioration significantly because of advances in the perception of molecular mechanisms involved in the pathogenesis of disease, which has facilitate early diagnosis and novel therapeutic strategies (7).

This study aimed to substantiation the impact of IL4, C3 and C4 in patients with Systemic Lupus Erythematosus.

PATIENTS AND MATERIALS

Selection of patients

During the period 2/January/2013 to 1/October/2013, fifty patients with Systemic Lupus Erythematosus that diagnosed by clinic specialists at female with ages ranged between (8-65) years were taken from (Al-Hussain Hospital City/Kerbala) .Control group consisted of 10 healthy people who were free from signs and symptoms of SLE who matched in age and gender with patients, and had no history for this disease.

Sample collection and assay procedure

Blood sample (5ml) was collected left at room temperature and then centrifuge for 15 min. at (3000 rpm). Serum was then separated and freezed until time of analysis. Estimation of ANA indirect Immunofluorescence test Euroimmune (Germany), anti-dsDNA ELISA kit (Cusabio/China) normal range (20 ng/ ml), C3, C4 Radial Immunodiffusion Plate (Bussero –Italia) (C3 normal range 91-156 mg/dl and C4 normal range 20-50 mg/dl), IL4 ELISA kit (Cusabio/China) normal range (100 pg /ml) in serum using commercially available and performed as recommended in leaflet with kit.

BIO-STATISTICAL ANALYSIS

Statistical analysis was performed using SPSS version 22. The normally distributed variables and nonparametric variables, were expressed by using Kolmogorov-Smirnov test. The normally distributed variables of the results were expressed by using t-test (mean ±SD). The Mann-Whitney test was used to compare the nonparametric variables as median (minimum-maximum) and the non-parametric Kruskal-Wallis test for unpaired samples was used among age groups. The correlations between the parameters under study levels were established by the Spearman's test. Differences were considered significant at $p<0.05$.

RESULTS

The study include 56 female patients of SLE and 10 healthy as control group. The mean age of patients with SLE was 36.1±14.3 years with median of age 33.5 years and that of control group was 49±7.6 years with median of age 47 years. In (Table 1) the demographic and clinical characteristics of SLE patients and healthy controls are summarized in it. The elevated level of laboratory parameters; ANA, anti-dsDNA and IL-4 were measured in SLE patients which reflect the severity of disease, whereas there were no significant difference ($p>0.05$) in C3 and C4 when compared between patients and control group.

Also there were no any significant difference ($p>0.05$) among the three age groups of patients with the parameters under study (Table 2).

Also the relationship between serums C4 with anti-dsDNA was analyzed and showed positive correlation between them, whereas there was no association between the others parameters under study (Table 3).

DISCUSSION

These study reported that some autoantibodies have important immune regulatory functions.

Anti-dsDNA antibodies proved helpful in the precision and early diagnosis of SLE patients associated with dermatological features (8).

Regulation of anti-DNA and anti-ANA production is most importance in understanding lupus pathogenesis (9). Role of specific anti-dsDNA antibodies and anti-Ro antibodies in the pathogenesis of lupus nephritis although the underlying mechanism is incompletely understood (10).

SLE can stimulate cytokine production in the tissues to induce inflammation and damage (11). There is evidence that cytokines playing a role in autoimmune diseases such as systemic lupus erythematosus. Th1, Th2 appears important factor responsible for pathophysiology of lupus (12).

The role of IL4 in down regulation of Th1 that contributed in prevention of autoimmunity unclear (13). Others suggested IL-4 play a role in the pathogenesis may differ between certain subsets of SLE, even if they show similar disease phenotypes (14).

Other study reported that IL4 may be play a role in pathogenesis of lupus (15). The IL4 has a role in regulation of Th1 remains unclear (16).

Our study investigated major role of C3, C4 in lupus. Researchers believed that C3 and autoantibodies prevent phagocytosis in mice (17), whilst another study showed that both C4 and autoantibodies eased phagocytosis of necrotic cells (18). Complement C4 supplies an important protective role against the expansion of SLE (19). Classical pathway proteins (C3, C4) particularly were strongly associated with the developmental SLE (20).

Table 1 Demographic characteristics of patients with Systemic Lupus Erythematosus (SLE) and healthy controls

	SLE patients	Controls	P-value
Number (n)	56	10	
Age(yrs) Median (mean ± SD)	33.5 (36.1±14.3)	47 (49±7.6)	0.07
ANA median (minimum-maximum)	0.006 (0-257.6)	0	0.001
anti-dsDNA median (minimum-maximum)	122 (0-383)	0	0.001
IL-4 median (minimum-maximum)	6.7 (0- 3562.71)	0(0-57)	0.001
C3 median (minimum-maximum)	127(27-312)	172(126-312)	0.08
C4 median (minimum-maximum)	24.4 (6-85.8)	18(7.2-39)	0.3

Table 2 The levels of parameters under study according to the age groups represented as median (minimum-maximum)

Parameters	Age (8-20)yrs groups	Age (21-40)yrs groups	Age (41-65)yrs groups	P-value
ANA	0.003 (0-257)	0.006 (0-5.8)	0.006 (0-245)	0.4
anti-dsDNA	130 (0-338)	116 (0-383)	65 (0-240)	0.8
IL-4	4 (1.4-3562.712)	7 (0-3439.74)	6.3 (0-116)	0.7
C3	127 (27-312)	126 (27-312)	160 (40-313)	0.4
C4	39 (6-86)	24 (6.6-86)	18 (7-75)	0.6

Table 3 Correlation between the parameters under study by using Spearman's rho coefficient

Parameters	ANA	anti-dsDNA
IL-4	-0.05	-0.1
C3	0.2	0.001
C4	0.1	0.3*

*Correlation is significant at $p<0.05$

CONCLUSIONS

The elevated levels of ANA and anti-dsDNA reflects the severity of the disease. IL4 play a role in pathogenesis of SLE, also there was a positive relationship between C4 with anti-dsDNA in the SLE patients. Feasibility of these parameters were to predictions of disease activity.

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