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ORIGINAL ARTICLE

Serum Immunoglobulin and Complement Component Levels in Patients with Atopic Dermatitis

Ihsan Edan Al-saimary[1], Sundis S. Bakr[1], Khalil E. Al-Hamdi[2]
[1]Dept. Microbiology, [2]Dept of Medicine, Coll. Medicine. University of Basrah, Basrah, IRAQ
E.mail: Ihsanalsaimary@yahoo.com

ABSTRACT
The value of Immunoglobulin (Ig); IgA, IgG and IgM and complement components C3 and C4 were measured in sera of patients with atopic dermatitis and compared with healthy /or control individuals in Basrah providence, IRAQ. The means of IgA, IgG, IgM, C3 and C4 reached (352.4, 1717.8, 255.8, 218.3 and 42.9) mg/dl of AD patients and (200.5, 1115.8, 145.7, 139.9 and 30.1) mg/dl of healthy /or control group respectively (P< 0.001). All means of immunological parameters of AD patients were highly than those of healthy/or control group in percentages (68.9, 67.5, 67.5, 69.3, 78.3)% respectively with very highly significant differences (P< 0.001).
***Key words**: Immunoglobulin, complement component, atopic dermatitis.*

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INTRODUCTION

Atopic dermatitis (AD) is a chronic inflammatory skin disease associated with cutaneous hyperreactivity to environmental triggers that are in nocuous to normal non atopic individuals [1]. The clinical phenotype that characterizes atopic dermatitis is the product of interactions between susceptibility genes, the environment, defective skin barrier function, and immunologic responses [2]. A normally functioning immune system entails all the forces and mechanisms concerned with recognition, specific response and removal of foreign subjects after they again access into the body of the host [3]. AD is associated with elevated serum immunoglobulin-especially IgE-levels and sensitization to variety of inhalant, food, and microbial allergens [4]. The complement is one of the major effect or system in the process of inflammation [5]. Complement activation has been shown to occur in atopic dermatitis [6].
In this study, we aimed to determine the serum levels of Immunoglobulin (Ig), A, G, and M, and C3 and C4 components of complement in patient with atopic dermatitis.

MATERIAL AND METHODS

Patients: A total of (212) AD patients in various age groups of both sexes were included in this study. AD patients attending the out patients of department of dermatology of main hospitals in Basrah providence, IRAQ.AD was diagnosed based on criteria of (7, 8 and 9). The study was carried out during a period from November 2003 to July 2005.
The patients (male & female) were grouped into five groups according to [10,11,12 and 13]. These groups are:
Infantile group (1): less than two years.
Childhood group (2): from two to less than eleventh years.
And adulthood groups: over than eleventh years, and this group subdivided into group (3): from eleventh to less than twenty years.
Group (4): from twenty to less than thirty years.
And group (5): over than thirty years.
Control group: A total of 100 healthy individuals were randomly collected (without any AD features, skin infection, immunological and allergic disorders to compare with AD patients).
Blood sampling: 5 ml of blood was collected by venous puncture in a suitable tubes from patient and control groups [14].
Measurement of immunoglobulin & components of complement concentrations by single radial immunodifusion test (SRID).

Commercial kits of radial immunodifusion plate (Biomagherb, Tunisia) were used to determine the concentrations of IgA, IgG and IgM and C3 and C4 component of complement for AD patients. Each plate (12-tests plate) contains monospecific antiserum directed against above immunological parameters which incorporated in an agarose gel layer.

5µl of serum from AD patients and control samples were placed in wells then incubated at room temperature for 48 hrs to IgA, IgG , C3 and C4 plates, while IgM plates were incubated for 72 hrs. The diameter of each precipitation ring was measured directly by using specialized magnifying lens with micrometers scale. The diameter of the ring is related to antigen concentrations and the results were evaluated by using reference standard table that packaged with the kit instruction method supplied by (Biomagherb-Tunisia).

Statistical analysis

Chi-square test and ANOVA test were carried by using computer program SPSS ver. 11, and statistical similarities were carried by using Minitab program ver. 10.

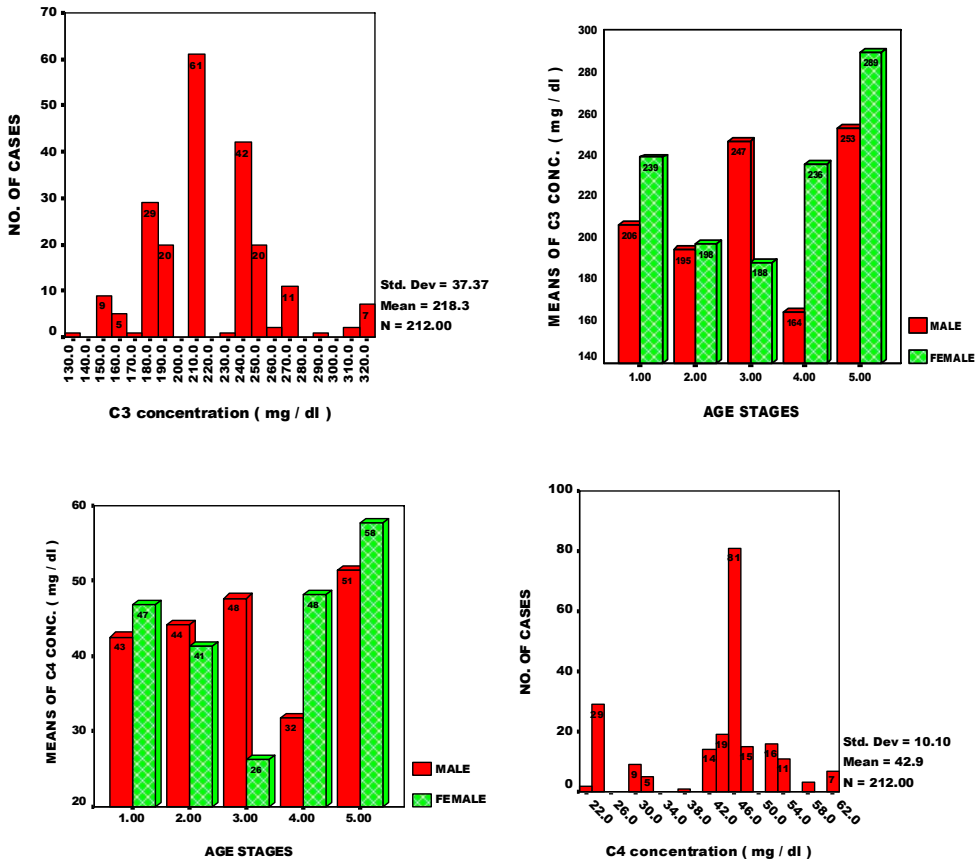
RESULTS

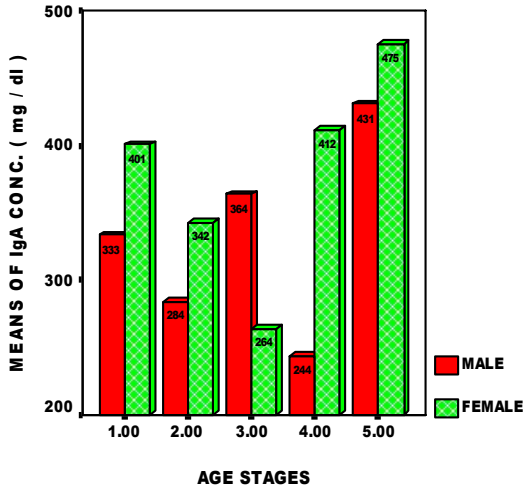
Figures (1) Illustrated means of all studied immunological parameters . The mean of IgA, IgG, IgM, C3 and C4 levels reached (352.4, 1717.8, 255.8, 218.3 and 42.9) mg/dl respectively of AD patients in various age groups (P< 0.001), while the means of this immunological parameters in healthy /or control groups recorded (200.5, 1115.8, 145.7, 139.9 and 30.1) mg/dl respectively (P< 0.001).

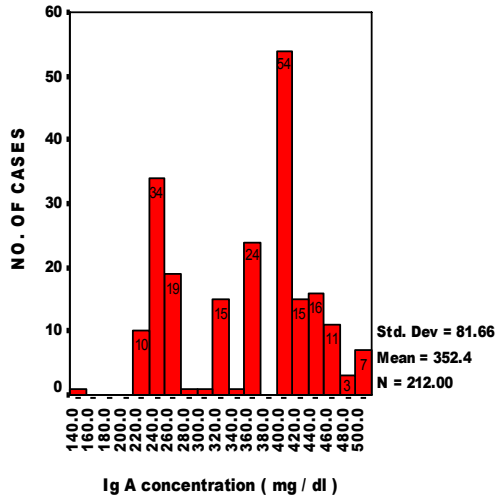
All value means of IgA, IgG, IgM, C3 and C4 of AD patients are highly than those of healthy/or control group in percentages (68.9, 67.5, 67.5, 69.3, 78.3)% respectively with very highly significant differences (P< 0.001).

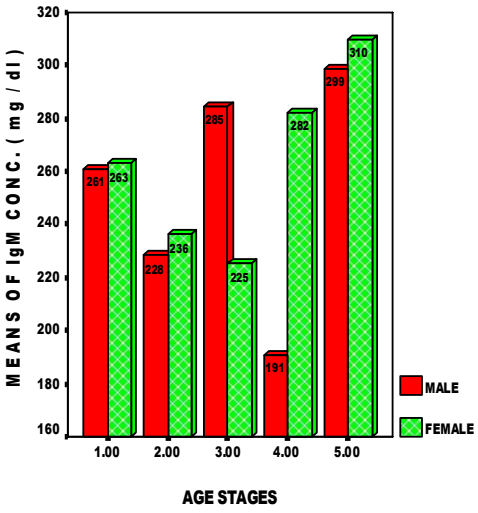
The study statistical similarity analysis, found that are tightly correlated similarity in range between 94-95% of IgA, IgG, IgM, C3 and C4. (P< 0.001). Fig(2)

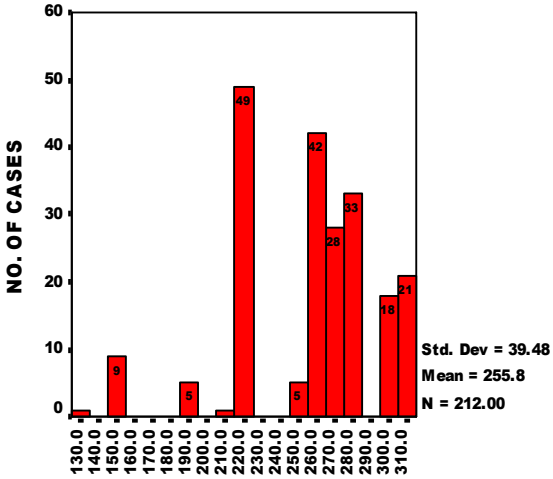
Fig : 1.Illustrated All Of Studied Immunological Parameters For Ad Patients. (P < 0.001)
Left : Statistical Immunological Means For All Ad Patients.
Rigth : Descriptive Immunological Means For Various Age Groups Of Ad Patients (Male & Female) .

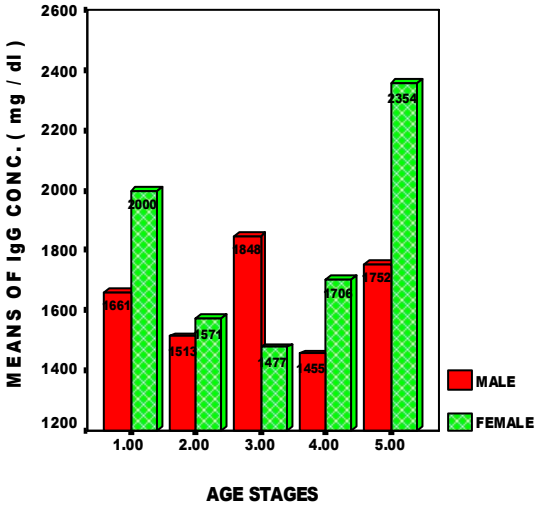



MEANS OF IgA CONC. (mg / dl)
500
400
300
200
333
401
284
342
364
264
244
412
431
475
1.00
2.00
3.00
4.00
5.00
AGE STAGES
MALE
FEMALE


NO. OF CASES
60
50
40
30
20
10
0
10
34
19
15
24
54
15
16
11
3
7
140.0
160.0
180.0
200.0
220.0
240.0
260.0
280.0
300.0
320.0
340.0
360.0
380.0
400.0
420.0
440.0
460.0
480.0
500.0
Ig A concentration (mg / dl)
Std. Dev = 81.66
Mean = 352.4
N = 212.00


MEANS OF IgM CONC. (mg / dl)
320
300
280
260
240
220
200
180
160
261
263
228
236
285
225
191
282
299
310
1.00
2.00
3.00
4.00
5.00
AGE STAGES
MALE
FEMALE


NO. OF CASES
60
50
40
30
20
10
0
9
5
49
5
42
28
33
18
21
130.0
140.0
150.0
160.0
170.0
180.0
190.0
200.0
210.0
220.0
230.0
240.0
250.0
260.0
270.0
280.0
290.0
300.0
310.0
Ig M concentration (mg / dl)
Std. Dev = 39.48
Mean = 255.8
N = 212.00


MEANS OF IgG CONC. (mg / dl)
2600
2400
2200
2000
1800
1600
1400
1200
1661
2000
1513
1571
1848
1477
1455
1706
1752
2354
1.00
2.00
3.00
4.00
5.00
AGE STAGES
MALE
FEMALE

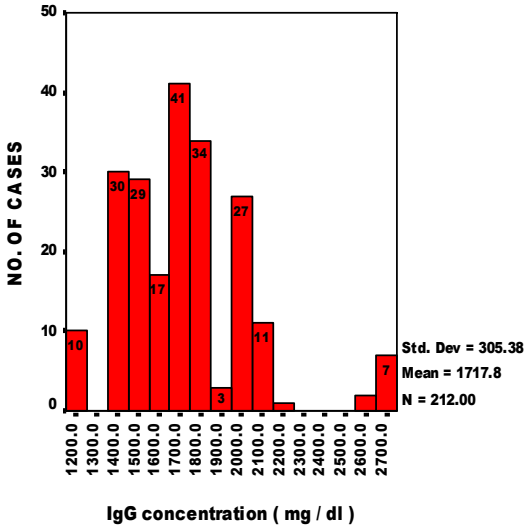
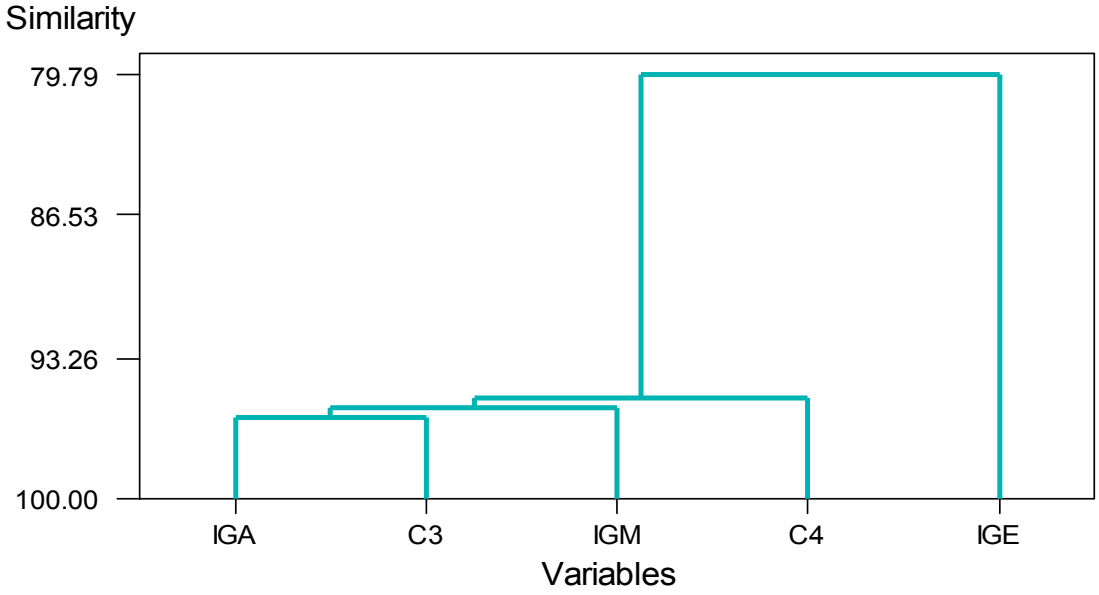

NO. OF CASES
50
40
30
20
10
0
10
30
29
17
41
34
3
27
11
7
1200.0
1300.0
1400.0
1500.0
1600.0
1700.0
1800.0
1900.0
2000.0
2100.0
2200.0
2300.0
2400.0
2500.0
2600.0
2700.0
IgG concentration (mg / dl)
Std. Dev = 305.38
Mean = 1717.8
N = 212.00

FIGURE 2 : Statistical Similarities Between Various Types of Immunoglobulinsand Complementes.(P< 0.001)



DISCUSSION

The concept that AD has an immunologic basis is support by the observations about elevation of immunoglobulin and component of complements value that evidenced in our study. This findings were compatible with the results of other studies that found elevation of immunoglobulin concentrations of AD patients and some experimentally AD animals [15,16].

Also, Senol, et al. 1997 found same elevation of Igs and complement component in population aged 1-63 years, and the IgM, IgG, IgA, C3 and C4 reached (1992.49, 188.91, 264.36, 157.91 and 29.12) mg/dl respectively, and concluded that immunity to atopic skin diseases involved mainly humoral, especially IgE-mediated, immune response but this syndrome is also associated with a cell-mediated immunological response against many kinds of exogenous and endogenous factors, or anon specific reaction [4,17]. Other recent studies interested in one or two types of immunoglobulin and components in various regions of the world [18-21]. The changes in the IgG, IgM, IgA and in particularly IgE may be specific response to a series of exogenous and endogenous antigens or a non specific reaction [4].

It is concluded that immunity to atopic skin diseases involved mainly a humoral, especially IgE-mediated, immune response but this syndrome is also associated with a cell-mediated immunological response against many kinds of exogenous and endogenous factors.

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