

Detection of Rheumatoid Factor(RF)-Iso Types and some Immunological Interactions in Patients with (Rheumatoid Arthritis - RA)in Thi-Qar Provenance -Iraq.

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Abstract

Rheumatoid factor (RF) produce in rheumatoid arthritis (RA)disease associated with effect of some environment factors and smoking . In this study, we investigated whether the association between RF production and smoking was influenced by duration of disease. the samples were taken from fifty patients with RA ,that achieved four or more criteria of the 2010 American college of Rheumatology , the sample of control 20 healthy person were used the level of RF –iso type concentration was detect in serum of patients of control group . the samples of the present study were taken from the rheumatology department of AL-Hussein General Teaching Hospital in Thi-Qar province from beginning of September 2012 into end of march 2013.

The result shown high concentration of IgG -RF ,IgM-RF and IgA-RF (0.227,0.092and 0.245) respectively compare with control(0.102,0.095 and 0.092). with high statistically significant ($P<0.001$).Between studied group and control with IgM-RF,IgG-RF, and slightly statistically significant between studied groups($P<0.05$). ,in IgA.

Keywords: Immunoglobulins, Rheumatoid arthritis ,Rheumatoid factor; Smoking

Introduction:

Rheumatoid arthritis (RA) is a common autoimmune disease with a strong genetic component. Numerous aberrant immune responses have been described during the evolution of the disease.(Davidson 2006)We have confirmed previous reports that RF production is associate with smoking in RA patients. An association was also found between RF positivity and carriage of the SE, although significance was reduced or lost after correction for previous or current smoking. In agreement with a number of previous studies, we found that the association between the environment factor , long time of disease and RF positivity(Ruyssen- *et al.*, 2012; Lars *et al.*, 2005). Further studies are needed to elucidate the way in which these factors influence the production of RF One of the characteristic features of rheumatoid arthritis(RA) is the production of auto antibodies against the Fc portion of immunoglobulin G. These auto antibodies are generally known as rheumatoid factors (RF) and may be of the IgA, IgG, or IgM isotype. IgM-RF has been measured most commonly in RA, with many studies showing that the majority of RA patients (60–80%) are positive for this RF. Although a hallmark of RA, RF is not specific to this

disease and is found in some other chronic inflammatory conditions. IgA RF in particular has been found in diseases of the gut such as Crohn's and coeliac disease (Mac Dermott *et al.*, 1993; Sokjer, Jonsson *et al.*., 1995) Production of RF has also been associated with air pollution, occupational exposure to silica or asbestos (Lawrence *et al.*., 1971; Turner-Warwick 1978), coffee consumption (Heliovaara *et al.*, 2000), and cigarette smoking in healthy populations (Matthews *et al.*, 1973). (Tuomi *et al.*., 1990) There is evidence that increases in RF production occur before clinical onset of RA (Aho, *et al.*, 1985) (Toumi *et al.*., 1986; Halldorsdottir & Jonsson 2000). Smoking, obesity, alcohol consumption, and the risk of rheumatoid arthritis (Voight 1994).

Aim the study

to determine the levels rheumatoid factor and immunoglobulins when it connected to form RF- iso types by effect some environment factors , establishing the RF profile in patients with rheumatoid arthritis

Material and methods:

The study included fifty patients of Rheumatoid arthritis (RA) to detection concentration of IgG-RF and IgA-RF and thirty patient to detection IgM –RF They were achieved four or more of the criteria of the 2010 American College of Rheumatology, with 20 person apparently healthy volunteers as control group s. take 2mL of serum from each patient and use ELAS –kit human company –Germany to test concentration of levels of immunoglobulin's marker

Result

The presence of auto antibodies, in particular rheumatoid factor (RF), is a well-established indicator of RA disease severity. The antibodies may precede the onset of the disease by many years (11–13). RF is a classical pathogenic marker consisting of IgM and IgA antibodies directed against the Fc fragment of IgG. RF seem to be more specific and sensitive for diagnosis of RA and are also better predictors of poor prognostic features such as progressive joint destruction. In this study we selected few patients when there during disease above three years and by use ELISA kit we found result as blew :

Table(1) show concentrations of RF iso type in serum of studied group

name of groups	N	Mean	Std. Deviation
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IgG-RF(**)	50	0.227	0.0459
IgM-RF(**)	50	0.206	0.0524
IgA-RF*	50	0.245	0.3304
Control Ig G	10	0.102	0.0171
control IgM	10	0.095	0.0093
control IgA	18	0.092	0.0152
Total	168	0.199	0.1910

(*)Significant difference ($P < 0.05$).

(**) Highly Significant difference ($P < 0.001$).

This study demonstrated that there is clear significant difference between the patients group and control group as clarified in this table No 1 shown the all results of this test to detection of RF – iso types of immunoglobulin s when it is connected with Rheumatoid factors then transform into auto antibodies.

The result shown high significant difference between group of RA and control where value of $t = 14.804$ (Sig. (2-tailed= .000) ,Mean Difference is (.1254600).

found also high significant difference between group of RA and control to detect IgM- RF where value of $t = 6.160$ (Sig. (2-tailed= .000) ,Mean Difference is (.10473).

To detect IgA-RF between RA patients group and control group we found slightly significant difference between studied groups value of $t = 1.946$ Sig. (2-tailed= .056),Mean Difference = .1523711

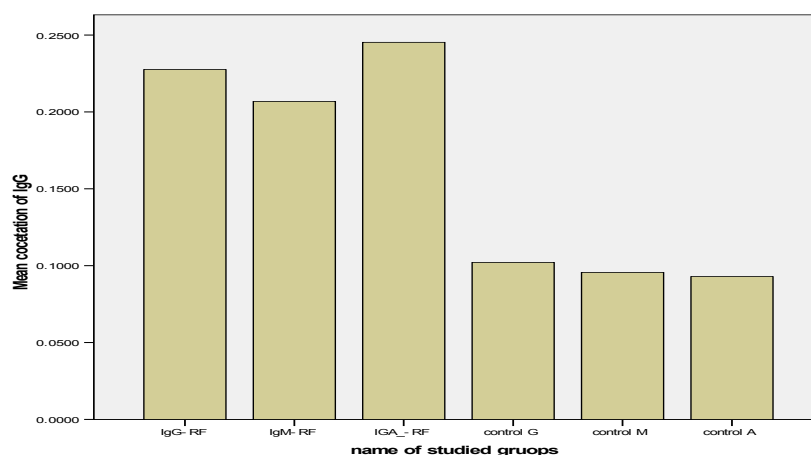
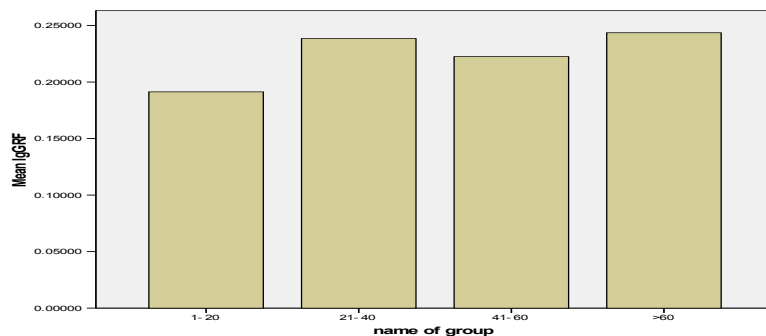


Figure (1) showed level of concentration of all RF- isotype comparison between them and with control groups . In this figure we showed also highly significant in RA patient s comparison control groups.



Figure(2) showed level of concentration in IgG-RF comparison between the age group . In this figure demonstrated the high concentration of IgG-RF according age group where is found in (>60) group.

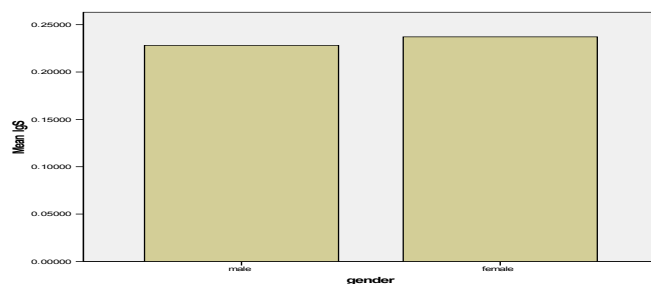


Figure (3) showed the high concentration of IgG-RF in female group than male group

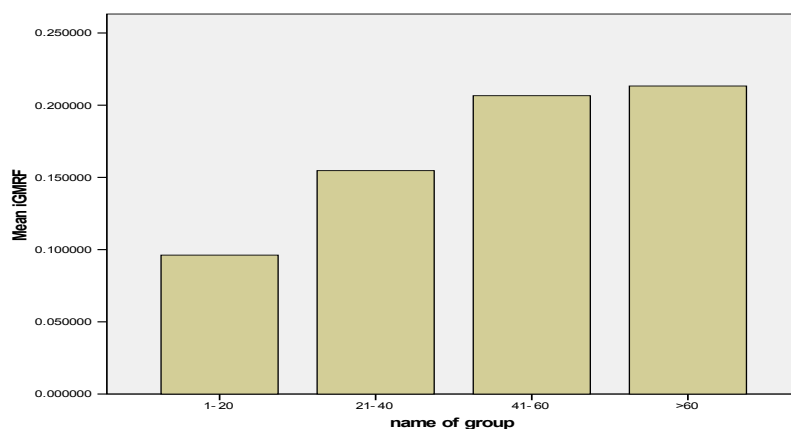


Figure (4) showed level s of concentration s in IgM-RF comparison with age groups.

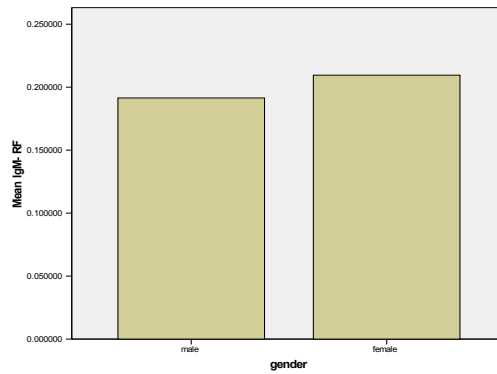


figure (5) showed level of IgM-RF comparison with gender where the high level in female group than male .

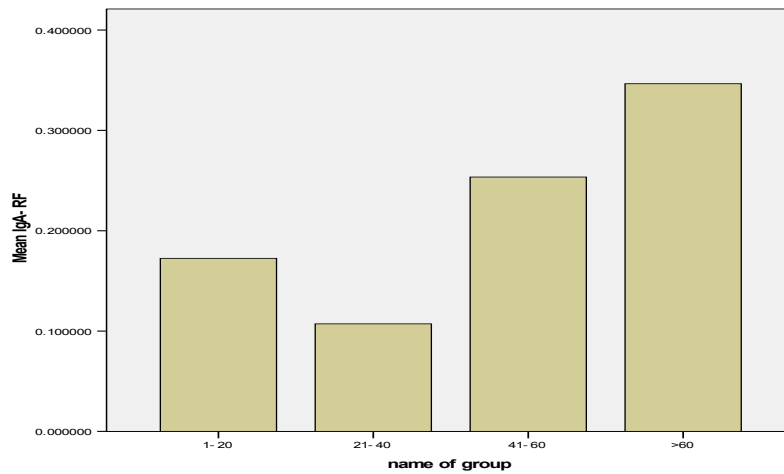


Figure (6) showed level of IgA-RF concentrations with age group where found high level in (>60) comparison other groups in this study.

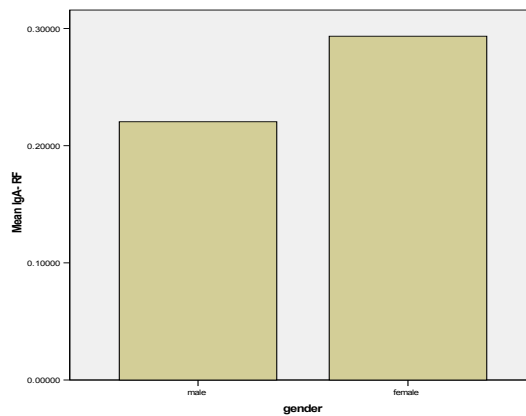


Figure (7) the level of IgA-RF concentration where found high level in female group than male .

Discussion:-

Rheumatoid factor as a marker of rheumatoid arthritis included into RA classification criteria for more than half a century. It was demonstrated in a number of studies to be present in the sera of patients with rheumatic and non rheumatic diseases and even of healthy persons (Stropuviene *et al.*, 2005). These immunoglobulin connected with RF after years of infection, directed against the Fc portion of IgG molecule, have been on the rheumatologic stage for longer than 60 years and still the only established serologic markers of RA (Steiner & Smolen, 2002). Studies with monoclonal and polyclonal RF have shown poly reactive RF with binding specificity for substances other than IgG, such as nuclear components (Schumacher 1993). In addition to the common IgM RF, both IgA RF and IgG RF have been detected. IgA RF has been related to more severe disease with erosions. The group of RFs is among the only autoantibodies clearly shown to be involved in disease pathogenesis (Smolen & steiner 1998). RF can be detected in 60-80% of RA patients and in up to 15% of healthy individuals (Schellekens *et al.*, 1998). (Steiner & Smolen, 2002). In this study we found significant difference ($P < 0.001$) between studied groups. in agree with (Hanaa, 2010) found a strong significant difference between group and age group .this study showed higher level of RF- isotype in IgA-RF, this study in agree with (Abbas 2003) who found significant difference ($P < 0.001$) between studied groups . so (Abbas 2003). And this study agree with (Lawrence *et al.* ,1971) and (Turner-Warwick.,1978) Production of RF has also been associated with air pollution, (Tuomi *et al.* , 1990) Relationship Among the HLA–DRB1 Shared Epitope, Smoking, and Rheumatoid Factor Production in Rheumatoid Arthritis and in agreement with(A. Ruysen-Witrand *et al.*, 2012),(Lars 2005) concerning found strong insights into the genetics of immune responses in rheumatoid arthritis. Because of heavy weave of dust in Al- Nassiriya city in long time of year,so that this study in agreement with (Sokjer & Jonsson.,1995) and with (Lawrence *et al.* , 1971) for this reason .

Conclusions :some of environmental factor such as smoking and air pollution and dust ,as well as inhalation of airborne pollutants such as silica or asbestos reactive with genetic factor to detection this immunological markers in patient with RA.

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الكشف عن الأنواع المتمثلة للعامل الروماتيزمي (RF) وبعض التفاعلات المناعية في مرضى التهاب المفاصل الرثوي في محافظة ذي قار – العراق.

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الخلاصة:-

العامل الروماتيزمي (RF) الذي ينتج في مرض التهاب المفاصل الرثوي بالارتباط مع بعض العوامل البيئية والتدخين , نحن نتحرى فيما اذا كان هنالك ارتباط بين إنتاج العامل الروماتيزمي والتدخين متأثراً بفترة المرض . تم أخذ عينات من خمسون مريضاً بالتهاب المفاصل الرثوي والذين أنجزوا أربعة أو أكثر من معايير الكلية الأمريكية لأمراض الروماتيزم للعام 2010 وكما شملت العينة 20 شخص من الأصحاء ظاهرياً كعينات سيطرة استخدمت للكشف عن مستوى تركيز الأنواع المتمثلة للعامل (RF) عينات هذه الدراسة جمعت من قسم أمراض المفاصل في مستشفى الحسين التعليمي في محافظة ذي قار للفترة من بداية أيلول 2012 إلى نهاية آذار 2013.

وجد ان تركيز مرتفع من (IgA-RF , IgM-RF , IgG -RF) بمعدلات هي (0.245 , 0.092 , 0.227) على التوالي مقارنة بمجموعة السيطرة (0.092 , 0.095 , 0.102) على التوالي و هذه الدراسة أظهرت فرقاً معنوياً عالياً مقداره ($P < 0.001$) بين مجموعة السيطرة ومجموعة المرضى . لكل من (IgM-RF , IgG –) و (RF) فرقاً معنوياً طفيفاً ($P < 0.05$) بين مجموعة الدراسة بالنسبة للعامل (IgA-RF).