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Rheumatoid Arthritis and some Demographical and Clinical Parameters

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ABSTRACT: Rheumatoid Arthritis is a heterogeneous, symmetrical chronic autoimmune inflammation of body joints, it infects the population with a ratio reaching 1% of the population's world, and it can lead to bone erosion and deformities, and finally damage. Smoking is one of the important factors that increase the risk of RA infections by aiding in citrullinated protein production, CRP increases in RA patients and binds with the severity of the disease. The aim of the study is to evaluate the CRP and smoking effects on RA patients. 150 blood samples were taken; 100 for RA patients and 50 for healthy control, the patients were taken from the Baghdad Teaching Hospital / Rheumatologically Consulting Clinic in the period from November 2021 to February 2022. The ages of patients range from 22 to 72 years old, and 26 to 62 years old was the age range of the healthy controls. 2ml of venous blood was taken in a gel tube for the CRP test by agglutination method. The result of the current study shows a highly significant differences between the RA patients and control groups in family history and CRP. While, it shows a non-significant difference for smoking. The conclusion of the current study was that CRP and family history associate with rheumatoid arthritis, and the smoking is not associate with RA disease.

Keywords: RA; CRP; Smoking; Family History

1. INTRODUCTION

Many factors may act to increase RA disease activity; one of these factors is the overweight. Remission in the fat patients is decreased in rate as compared to those with fit weight, obese show high score of inflammation, severe illness and bad assessment of disease activity, although they do not show increased mortality rate [1]

Pulmonary disease is mostly associated with RA after a period of infection. It can be a serious problem that may lead to death in RA patients. This can be increased in heavy smokers, with progressed age, and those with the seropositive antibody of rheumatoid. The toxicity of the drug is the most common complication in interstitial lung disease (ILD)[2]. The RA can contribute to early death and shorten the age ratio. Its common complications are cardiovascular, skeletal, pulmonary, and psychological problems [3]. Joint destruction severity is correlated with increasing the loss of functions progressively, effective therapy may get performance better due to the correlation between the destruction and duty performance [4].

C reactive protein (CRP) is a pentameric protein that combines with phosphor-choline (PCH) in a Calcium-dependent manner [5]. This protein is secreted by the liver due to the influence of interleukin-6 (IL-6) on the gene that transcript CRP in acute inflammation [6]. Its level is elevated in many conditions like inflammation, trauma, and other infections which include tissue injury, then lowered fast as the causative agent cleared. It triggers the complement activation, facilitates the phagocytosis of microorganisms, attaches to the FC receptors to improve tenderness, and triggers adaptive humoral immunity [7]. CRP act as a pro-inflammatory, it stimulates monocyte chemotactic protein, its opposite effect can be decreased by using the treatment for anti-atherosclerosis [8]. It is an essential marker for RA and its level is believed to correlate with the severity of infection and bone damage, cardiovascular complications, lung disease, and metabolic and diabetes mellitus. Furthermore, its increase indicates the development of bad situations and risk conditions; thus it aids in RA disease activity detection and determines the benefit of the therapy [9].

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Nomenclature
RA: Rheumatoid Arthritis
CRP: Acute Reactive Protein
H.S: Highly Significant

2. Materials and Methods

In this study, 150 blood samples were taken; 100 for RA patients and 50 for healthy control, the patients were taken from the Baghdad Teaching Hospital / Rheumatologically Consulting Clinic in the period from November 2021 to February 2022. The ages of patients range from 22 to 72 years old, and 26 to 62 years old was the age range of the healthy controls.

Two ml of blood was taken in a gel tube for the CRP test. CRP test is measured by a qualitative and semi-quantitative method by passive Agglutination and serial dilution test to detect its approximate titer (Biosam, UAE). Acute reactive protein has been done by latex agglutination method and serial dilution to get approximate titer, fifty microliters of serum sample were added to one of the card's circles, 50 µl of positive control, and 50 µl of negative control had been added to the circles, respectively. Then the 50µl of latex reagent was added to each circle and mixed, agglutination remarked within 2 minutes. The appearance of agglutination indicates a positive result, while homogeneous refers to the negative result. If a positive result appeared a serial dilution was done to get the titer. One hundred microliters of 9 g/l Na Cl as diluent was pipetted and put on the card's circles, then one hundred µl of a positive serum sample was added to the first circle, after that, one hundred µl from the first circle mixture was pipetted and added to the next circle, and so on; until reaching the last dilution circle. After discarding the last 100 µl of the mixture, 100 µl of the CRP latex reagent was added and mixed by the stick over the circle at 2 min, to get the last visible agglutination, and mentioned its titer. The serial double dilutions were 1:2, 1:4, 1:8, 1:16, and 1:32 sequentially. The concentrations of diluted samples were 12, 24, 48, 96, and 192 respectively. The concentration can be measured by multiplying the last positive titer by the analytical sensitivity of the test which equals 6 mg/l. [concentration (C) = sensitivity (S.) x dilution (D)].

3. Statistical analysis

Data of the current study were analyzed by using Chi-square (X2) test to compare percentages. Independent samples T. Test was used to compare two numeric continuous variables mean. A level of significance of α=0.05 was applied to the test. Statistical Package for the Social Sciences SPSS v.23 programs used to analyze current data.

4. Results and Discussions

The study results presented in table (1) show that 82(82.0%) of the RA patients had negative CRP titer at <6 (mg/L), while 18 (18.0%) of the RA patients had positive CRP titer at >6 (mg/L). The differences in the frequency of this test were highly significant with a p-value = 0.001.

Table 1. - Distribution of study groups according to the Rheumatoid factor and C-reactive protein

CRP		Patient	Control	Total	Chi-square	p-value
Negative	NO.	82	50	132	10.2	0.001 (H.S)
	%	82.0%	100.0%	88.0%		
Positive	NO.	18	0	18		
	%	18.0%	0.0%	12.0%		
Total	NO.	100	50	150		
	%	100.0%	100.0%	100.0%		

H.S; highly significant, CRP: C-reactive protein.

CRP in this study showed a highly significant difference, although it is not specific but; this protein is elevated in acute inflammation and that's the same as mentioned by [10]. CRP was reduced in regularly treated RA patients due to the action of drugs like TNF-α inhibition that act to decrease the inflammation and disease activity so decreasing the CRP [11]. Another possible explanation for the lower proportion of CRP positive positive cases is because RA is a chronic and CRP elevated in acute inflammation or early detected infections, or when the patients are out of the treatment and the activity of the disease increases rendering the disease to the active form. CRP can be considered as a marker for functional impairment and may need to change the treatment protocol or add therapy.

Family History and Smoking Status in RA Patients

Table 2 illustrated that 72(78%) patients with RA had no family history of a genetic disorder or autoimmune disease, while 28 (28.0%) had a family history of RA. This difference was scored as highly significant with a p-value = 0.000. Additionally, 85.0% of RA patients were non-smokers, while the rest of the patients 15.0% were smokers; this difference was non-significant with a p-value = 0.1.

Table 2. - Distribution of study groups according to family history and smoking status

Family history		**Study Groups**		**Total**	**p-value**	**Chi-square**
		Patient	**Control**			
Positive	NO.	28	0	28	0.000 (H.S)	17.2
	%	28.0%	0.0%	18.7%		
Negative	NO.	72	50	122		
	%	72.0%	100.0%	81.3%		
Total	NO.	100	50	150		
	%	100.0%	100.0%	100.0%		
Smoking status		**Patient**	**Control**	**Total**	0.1 (N.S)	1.47
Positive	NO.	15	4	19		
	%	15.0%	8.0%	12.7%		
Negative	NO.	85	46	131		
	%	85.0%	92.0%	87.3%		
Total	NO.	100	50	150		
	%	100.0%	100.0%	100.0%		

H.S; highly significant, N.S; non-significant.

This study showed that RA patients with a family history of the disease were lower than those without as mentioned by another study [12]. This may be related to other causes of RA rather than inheritance and genetics, and this difference was highly significant at P- value = 0.000 and which resembles [13]. Another parameter is smoking which showed a higher percentage of nonsmokers than smokers as shown by other studies with a nonsmoker percentage of 85%, and 89.52% respectively with a non-significant difference with a p-value = 0.45 [14] [15], this result may be related to the sample size, gender, and according to the natural population habits of the Iraqi patients.

5. Conclusions

Family history was not associated strongly with RA infections in the studied group of patients. in addition, Smoking was not correlated with RA disease. Furthermore, CRP can use as an indicator of the RA diagnosis and prognosis.

6. Recommendations

A larger size sampling number may be required to study the correlations. Hs-CRP is recommended to give more accurate results.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest

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