

How to Cite:

Ali, R. J. M., & Ahmed, I. H. (2022). Evaluation of interleukin 6 (il-6) levels among Iraqi rheumatoid arthritis patients. *International Journal of Health Sciences*, 6(S7), 563–567.
<https://doi.org/10.53730/ijhs.v6n7.11087>

Evaluation of interleukin 6 (IL-6) levels among Iraqi rheumatoid arthritis patients

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Abstract---Rheumatoid arthritis (RA) is complex autoimmune system disease and significant impact on the health of population in our world. Numerous studies confirmed that genetic factors play a crucial role in the pathogenesis of RA. Interleukin-6 (IL-6) is a common pro-inflammatory cytokine with various functions in different pathophysiologic systems, especially in the development of RA. The Interleukin-6 (IL-6) is affected by common, functionally important genetic polymorphisms. Serum Interleukin-6 (IL-6) levels were higher in rheumatoid arthritis subjects than in nonrheumatoid arthritis subjects. (IL-6) may be a potential biomarker in rheumatoid arthritis (IL-6) concentrations in sera were measured by "enzyme-linked immunosorbent assay (ELISA)" technique using Human-Interleukin-6 (Bioassay Technology Laboratory). The results of the present study demonstrate that highly significant differences. The aim of this study is to evaluate serum levels of IL-6 among Iraqi RA patients. the IL-6 levels in the rheumatoid arthritis patients were higher than that of controls (126.6436 ± 30.63222), controls (119.0229 ± 54.50154), $P = 0.899$. It is noteworthy that the (IL-6) levels in the current study were IL-6 levels were higher in males than in females when comparing male patients with female patients (181.7823 ± 117.92967 versus 110.4356 ± 34.83798), $P = 0.558$. We conclude that there may be a correlation between high levels of (IL-6) and rheumatoid arthritis.

Keywords---(IL-6), RA , ELISA

Introduction

Rheumatoid arthritis (RA) is complex autoimmune system disease and significant impact on the health of population in our world(Hen et al.,2021). Numerous studies confirmed that genetic factors play a crucial role in the pathogenesis of RA(Hen et al.,2021). Interleukin-6 (IL-6) is a common pro-inflammatory cytokine with various functions in different pathophysiologic systems, especially in the development of RA (Schotte et al., 2015). The high expression concentrations of *IL-6* and soluble *IL-6* receptors (sIL-6 R) in synovial and serum were observed to be assessed in RA patients, which suggested an important role of this cytokine in the pathogenesis of RA (Li et al., 2016).

At the present time, there are no studies of Iraqi population groups that investigated or investigated the evaluation of its levels in the sera of those patients. This study aims to evaluate of serum levels of (IL-6) in patients with rheumatoid arthritis among cases from Wasit province-Iraq.

Method

Materials and Methods

This study included (40) patients with RA (20 males, 20 females) whose ages ranged from 25 to 85 years, and (20) apparently healthy individuals(controls) subjects (10 males and 10 females) whose ages ranged from 25 to 85 years. from different regions in Wasit governorate.

Five milliliters of blood were collected from all participants and placed in a tube without anticoagulant and placed in a centrifuge at a speed of 2000 rpm for 10 minutes. After that, the serum was withdrawn into an eppendorff tube 2ml and preserved after being labeled with deep freezing until further processed. (IL-6)concentrations in sera were measured by "enzyme-linked immunosorbent assay (ELISA)" technique using Human- Interleukin-6 (Bioassay Technology Laboratory)

Results

Serum levels of *IL-6* 174 G/C in patients with rheumatoid arthritis and controls

The results is shown in Table (3-5).The results reveal that although there were no significant differences, the IL-6 levels in the rheumatoid arthritis patients were clearly higher than the controls (126.6436 ± 30.63222), controls (119.0229 ± 54.50154), $P= 0.899$.

Table 2
Serum IL-6 levels among patients with rheumatoid arthritis and controls

Parameters	Pg/ml Mean+ SD
Groups	
Control	119.0229 ± 54.50154
RA patients	126.6436± 30.63222
P-value	0.899
LSD	0.127
Statistical significance	NS

NS : non-significant

P>0.05 Pg:Picogram SD: Standard deviat

The same findings of IL- 6 levels among males and females was repeated for the study groups that we previously observed in the Table (3-6) as IL-6 levels were elevated in the patients compared to the control group, although there were no significant differences (181.7823±117.92967 versus 149.7978±56.39587), P = 0.110.4356±34.83798 versus65.2291±7.35843 ,P=0.218 respectively.It is noteworthy that the IL-6 levels were higher in males than in females when comparing male patients with female patients (181.7823±117.92967versus 110.4356±34.83798), P= 0.558.

Table 2
IL-6 levels among male and females of studied groups

Parameters	Pg/Mi Mean+ SD				
Groups	Male	Female	P-value	LSD	Statistical significance
Control	149.7978±56.39587	65.2291±7.35843	0.368	0.321	NS
RA Patients	181.7823±117.92967	110.4356±34.83798	0.558	0.423	NS
P-value	0.813	0.218			
LSD	0.13	0.423			
Statistical significance	NS	NS			

NS :Non-significant P> 0.05

SD: Standard deviation

Discussion

The results of the present study demonstrate that highly significant differences, the IL-6 levels in the rheumatoid arthritis patients were higher than that of controls (126.6436 ± 30.63222), controls (119.0229 ± 54.50154), $P = 0.899$. The results of this study were in agreement with Gaber *et al.*, 2013 who found that serum IL-6 levels were significantly higher in RA patients compared to control ($p = 0.04$). In agreement, higher levels of IL-6 were present in serum, synovial tissue and synovial fluid from patients with RA compared to those with non-inflammatory arthritis (Nile *et al.*, 2008; Chung *et al.*, 2011). Chronic joint inflammation in RA leads to the production of IL-6 and its receptor (IL6R), which is expressed on effector cells that cause and prolong inflammation. Interleukin-6 is over-expressed in synovial tissue in RA patients, with raised concentrations in serum and synovial fluid (Brandão *et al.*, 2010). High levels of IL-6 detected in synovial fluid from patients with RA have suggested the involvement of IL-6 in RA (Panoulas *et al.*, 2009). Previous studies have also found a significant correlation between serum IL-6 activity and the serum levels of various acute phase reactants (Brozik *et al.*, 1992; Houssiau *et al.*, 1988). Brozik *et al.*, 1992 and Swada *et al.*, 1991. found a correlation between synovial fluid IL-6 activity and rheumatoid factor in RA patients. These studies all suggest the importance of IL-6 in the pathogenesis of RA.

It is noteworthy that the IL-6 levels in the current study were higher in males than in females when comparing males patients with females patients (181.7823 ± 117.92967 versus 65.2291 ± 7.35843), with non-significant difference $P = 0.558$.

Conclusion

IL-6 levels are significantly correlated with RA and may reflect the proinflammatory state in rheumatoid arthritis

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