THE RELATIVE EFFECT OF INTERLEUKIN -6 LEVEL IN DIABETIC INDIVIDUAL IN SALAH AL – DIN PROVINCE – IRAQ

Huda Ayad Hameed¹, Sami A. Zbaar², Hadeel Abdulhadi Omear³

¹Department of Biochemistry, college of medicine, Tikrit university/Iraq
²Asst. Professor, Department of Biochemistry, College of Medicine, University of Tikrit/Iraq
³Asst. Professor, Department of Biology, College of Science, Tikrit University/Iraq

¹hudahameed199222@tu.edu.iq, ²Dr.samizbar@tu.edu.iq, ³hadeel.omear@tu.edu.iq

ABSTRACT:

Diabetes mellitus type 2 caused by many risk factor such as genetic, life style , environmental factor , that interact with each other and contribute to its spread.

Aim: This study aimed to evaluate the serum levels of Interleukin-6 (IL-6) of patients with type 2 diabetes mellitus among cases from Salah Al –Din province-Iraq , A total of 90 randomly selected subjects from Salah Al – Din province – Iraq: (60) patients with T2DM, and (30) apparently healthy subjects with normal fasting blood sugar as a control group. Enzyme-linked immunosorbent assay (ELISA) was used to measure the levels of interleukin -6 in sera from patients with type-2 diabetes mellitus. The results of this study showed that IL-6 concentrations had a non-significant difference when compared patients of type-2 diabetes mellitus with the control group.

1. INTRODUCTION:

IL-6 is a multifunctional cytokine produced by various of cells including fat cells, endothelial cells, smooth Muscle cells, fibroblasts, lymphocytes and macrophages. IL-6 mechanism of action under tight organization while its trading levels were high, It is linked to a variety of diseases such as obesity and diabetes and cardiovascular disease.¹

T2DM has also been recognized as an immune Mediated disease resulting in impaired insulin signaling and selective insulin destruction Production of beta cells ,in which cytokines play an important role . It is expected that the number of people with diabetes will reach 438 Million by 2030, an increase of 54% compared to expectations Information for 2010.²

2. MATERIALS AND METHODS

Blood sampling :-

Venous blood (3 ml) has been collected from the brachial vein of the individuals and placed in gel tubes. Then the serum has been quickly frozen at (−20°C) and stored until further processed (Estimating the concentration of interleukins (IL-6) from patients with T2DM).

Estimation IL-6 levels:

Interleukin-6 concentrations in sera were measured by ELISA using Human interleukin 6 ( IL -6 ) Elisa kit Sunlong Biotech CO.LTD / China .

Statistical Analysis:

Data were expressed as mean ± standard deviation (SD) , Differences

Between groups were tested with the Student’s t-test. The values of P < 0.05 were considered significant .
Patients group consist of 60 subjects with T2DM from Salah Al –Din province/Iraq and (30) apparently healthy subjects with normal fasting blood sugar as a control group were selected from Salah Al –Din general hospital .

3. RESULTS AND DISCUSSION

Table (1) Concentration of IL-6 in patients with T2DM and controls

<table>
<thead>
<tr>
<th>Groups</th>
<th>IL 6 concentration ng/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetic patients</td>
<td>13.20 ± 2.42</td>
</tr>
<tr>
<td>Control</td>
<td>10.65 ± 2.90</td>
</tr>
<tr>
<td>P value</td>
<td>0.142</td>
</tr>
<tr>
<td>Significance level</td>
<td>Non-significant</td>
</tr>
<tr>
<td>T-Value = 1.48</td>
<td>p value &gt; 0.05</td>
</tr>
</tbody>
</table>

The results of this determination as shown in Table 1, revealed that serum IL-6 concentrations displayed a non-significant difference in T2DM patients when compared with the control group (Diabetic patients 13.20 ± 2.42 compared with control 10.65 ± 2.90, P-value = 0.142).

The main reason for T2DM is unwell clear, in the last years, it has been detected that immune mediated diseases in which that cytokines plays an important role for this cause (3) In fact, type 2 diabetes is described as an inflammatory disease Cytokines play an important role in pathology. Inflammatory processes affect development Insulin resistance and decreased insulin secretion by pancreatic beta cells. Cytokines act as a signal Immune cell molecules, especially in autoimmunity diseases, so cytokines play their role in development and activate these cells (4).

Table 1 revealed a non-significant difference of IL-6 levels when compared patients with T2DM to control. These results are in disagreement with a study conducted Nuhair et al. (2018) (5), who mentioned that there was a significant increase in the levels of IL-6 among diabetic patients as compared with controls in a study conducted on the Nassryain population in Thi-Qar/ Iraq.

Hasan etal.(2015) (6) Indicated that the relationship between T2DM and pro-inflammatory cytokine was high and this include IL 1 , IL6 , and TNF-a which can arrest insulin signal pathway and lead B-cell damage, high level of TNF-a consider an important role for development of T2DM , so these results were in agreement to the present study.

Chronic low-grade inflammation in obesity, plays an important role in the subsequent development of insulin resistance. This results in a triple increase in levels of systemic cytokines including IL-6, thus It becomes a risk factor for T2DM (7) but this not match the current resent data because not taking obese individual with our consideration.

Abbatecola, A. M etal (2004) (8) found IL-6 serum levels were also established for Its linking to insulin resistance and diabetes. In older non-diabetic populations and middle-aged white females, this is possible Elevated levels of IL-6 which might significantly reflect adipocytes activation , this not in agreement with current data because not taking separation gender individual in the study.

According to some research groups, IL-6 is just an inflammatory marker that can identify the case of systemic inflammation. However, the multiplicity and breadth of this cytokine was taken into account range of actions on different cell types, high may precipitate inflammatory signaling mechanisms existing systemic and local inflammation mechanism. (1)

Existing evidence is not sufficient to establish a causal relationship between IL-6 levels and progression to metabolism and Cardiovascular disorders. Because of its multi-directional actions in Different tissues and organs, the exact role of IL-6 in the pathogenesis of diabetes must be carefully examined in the cell and in a tissue-specific manner, but allowing the possibility of Crosstalk between affected tissues and organs. (9)
Rotter et al (2003) showed the relationship between IL-6 and insulin resistance he stated that increasing levels of IL-6 activating JAK - 2/STAT-3 inflammatory response and play an important role in insulin resistance.

4. CONCLUSION:

In this study, we have determined the concentrations Interleukin-6 (IL-6)) in sera from patients with type-2 diabetes mellitus using enzyme-linked immunosorbent assay (ELISA). From this study, we concluded that the levels of IL-6 may not be related with diabetes mellitus.

Recommendation:

For a deeper look at The relationship between interleukins and type 2 diabetes mellitus, we suggest large-scale studies that include Different regions of Iraq.

REFERENCES: