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Assessment serum levels of IL-12 and IL-6 in psoriatic patients with and without Diabetic mellitus type 1

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Abstract

An exploratory study was conducted in a (Al-Diwaniyah Educational, Afak generaland Al- Najaf Educational)Hospitals as well as outpatient clinics in the city of Diwaniyah in Iraq ,enrolling 80 psoriasis patients They are classified into (40 patients with plaque psoriasis with D1M and 40 patients with psoriasis withoutD1M). and 80A healthy person , attending the dermatology clinic of the hospital between July 2023 and January 2024. Inclusion criteria were diagnosis of Inclusion criteria were diagnosis of psoriasis according to a reliable history findings and physical examination and giving an informed consent approved by our institutional ethics committee to enter this study. Patients with concomitant chronic, inflammatory and other autoimmune diseases were excluded from the study. we evaluated the level of immune interleukins 6 and 12 using the ELISA device according to the manufacturer's instructions .The results revealed a substantial rise in interleukin 6 and 12 levels in both instances (psoriasis withand without type 1 diabetes) as compared to controls. On the other hand, the study found that psoriasis patients with type 1 diabetes had a much higher quantity of interleukin 6 in their blood serum than those with psoriasis alone. The study also found a slight variation in interleukin 12 levels between the psoriasis group with and without type 1 diabetes.

Research aims

To check levels IL6 and IL12 In the serum of patients with plaque psoriasis, psoriasis with type 1 diabetes, and the control group, to detect the importanceand effect of these cytokines on them.

KEYWORDS: PsoriasisVulgaris , IL 6, Il-12 and D1M .

1- Introduction

Psoriasis is a prevalent immune-mediated inflammatory skin condition.[1]. About 90% of psoriasis patients have psoriasis vulgaris, also known as chronic plaque psoriasis, which is the most prevalent clinical presentation of psoriasis. The hallmark of psoriasis vulgaris is the presence of distinct, elevated, erythematous plaques with a white micaceous scale. Lesions tend to be symmetrically distributed on the scalp, postauricular skin, elbows, gluteal cleft, and knees, and range in size from tiny papules to huge plaques. Significant volumes of scale are produced by these lesions, and when the scale is removed, pinpoint bleeding occurs (the Auspitz sign), indicating thinning suprapapillary plate and dilated capillaries under the epidermis. [2,3,4] Trauma can cause psoriatic lesions, a phenomenon known as Koebnerization or the isomorphic reaction [5].

Psoriasis's pathophysiology is not well known. The pathophysiology of psoriasis most likely involves the interplay of T lymphocytes, dendritic cells, and inflammatory cytokines] 6[.

Psoriasis is an immune-mediated disease that causes hyperproliferation of keratinocytes in the dermis and epidermis, resulting in erythremous plaques with silvery lamellar scales [7,8]. Numerous autoimmune conditions like vitiligo, alopecia, and type 1 diabetes have been connected to psoriasis [9].Type 1 diabetes (is an autoimmune condition that causes the beta cells in the pancreas that produce insulin to die) and mostly affects youngsters and causes hyperglycemia and ketoacidosis due to a lack of endogenous insulin production. Pancreatic β-cells are destroyed by dendritic cells, macrophages, and auto- reactive lymphocytes (T CD4+ and T CD8+) that penetrate pancreatic tissue [10,11]. T1D is often complicated with other autoimmune diseases.

Psoriasis is frequently connected with significant autoimmune illnesses such as systemic lupus erythematosus, vitiligo, and alopecia areata. Aside from genetic predisposition, several biochemical mechanisms in psoriasis coincide with those in other autoimmune illnesses, such as Type 1 Diabetes [12].

Research aims

To check levels IL6 and IL12 In the serum of patients with plaque psoriasis, psoriasis with type 1 diabetes, and the control group, to detect the importance and effect of these cytokines on them.

2-Materials and methods:

2.1 Samples Collection:

From July 2023 to January 2024, 80 persons with plaque psoriasis and 80 healthy people were gathered. Not all patients received treatment, including biological treatments. Following health instructions, 5 ml of blood was drawn by venipuncture for each sample, left to clot for half an hour, then centrifuged at 3,000 cycles per minute for a quarter of an hour to separate the serum, then placed in a 1.5 capacity Eppendorf tube and frozen at -80°C until the test used in this study was performed. A 5 milliliter venous blood sample was drawn from each person who participated in this study using sterile means. The drawn blood sample was then placed in a gelatinous tube and then left for approximately 10- 20 minutes to clot. After that, the sample was placed in a centrifuge for a quarter of an hour until the serum separated completely, then it was emptied into 1.5 Eppendorf tubes and stored at a temperature of -70 degrees Celsius until the required test was performed. After completing the collection of samples required for the study, the level of interleukin 6 and interleukin 12 in the stored sample was measured using the ELISA device according to the manufacturer's instructions.

2.2 ELISA Kit method

The (Human IL-6)) and IL-12 ELISA Kit was performed in accordance with company directions. BT LAB

2.3 ELISA Kit

Table 1 shows the ELISA elements for determining serum levels of IL-6 and IL-12 in individuals with psoriasis vulgaris.

Pre-coated ELISA Plate	8 Well x12 Streps
Standard Diluent	3ml x1
Biotinylated Detection Ab Diluent	1ml x1
Wash Buffer Concentrate (25×)	20ml x1
Streptavidin-HRP	6ml x1
Substrate Solution	6ml x1
Stop Solution	6ml x1

2.4 Assay procedure

All kit components and samples were brought to room temperature prior to initiating the tests.The test was carried out as directed by the manufacturer, room temperature.

statistical analysis :

P values less than 0.001 are regarded as statistically significant. The Statistical Package for the Social Sciences (SPSS) software program, version 21 (IBM, New York, NY), was used to conduct the statistical analyses.

2-5 :**The inclusion criteria** .Psoriasis patients with D1M, psoriasis patients,

2-6 :**Exclusion criteria** Ps patients receiving chemotherapy and biological treatments, Ps patients with autoimmune diseases other than D1M and smokers.

Ethical standards: The Ministry of Health in Iraq's Medical Ethics Committee gave its clearance before research samples could be gathered. This followed the release of Order No.4129 dated 10/23/2023.

3-RESULT :

Estimated concentration of IL-6 in and IL-12 patients with PPS .

Table 1 Comparison of serum IL-6 and IL-12 levels between psoriasis vulgaris and psoriasis with and without DM type 1 groups and healthy controls

Index	Psoriasis Vulgaris without D1M group 1(n=40)	Healthy control group 1(n=40)	Psoriasis Vulgaris with D1M group 2 (n=40)	Healthy control group 2 (n=40)	P*
IL-6	56.65 (13.07, 1.48)	18.03(17.02, 0.22)	94.54(13.12, 35.29)	15.88 (10.01,0.19)	0.0001
IL-12	78.33 (211.34,65.42)	55.54 (198.30,45.12)	72.44 (343.56,231,41)	18.67 (34.54,56.81)	0.0001

The test found variations in the immunological parameters of interleukin 6 and interleukin 12 throughout the 160 samples analyzed in the study group, including the cases and the control group. The study groups showed statistically significant differences, with the case group exhibiting a considerably higher average level of interleukin 6 compared to the control group. Furthermore, there was a significant difference in the average level of interleukin 12 between the case and control groups.

In the first group, patients suffering from psoriasis without diabetes, showed a significant increase in the levels of interleukin 6 and interleukin 12 compared to the first control group, respectively, as in Table (2).

Table (2): **1 Comparison of serum IL-6 and IL-12 levels between psoriasis vulgaris and psoriasis without DM type 1 groups and healthy controls**

Index	Ps vulgaris without D1M group 1(n=40)	Healthy control group 1 (n=40)	P*
Il-6	56.65 (13.07, 1.48)	18.03(17.02, 0.22)	0.0001
Il-12	78.33 (211.34,65.42	55.54 (198.30,45.12)	0.0001

The table's findings demonstrate that the control group's interleukin 6 and interleukin 12 levels were substantially lower than those of the second group,which consisted of type 1 diabetic psoriasis patient

Table (3): **Comparison of serum IL-6 and IL-12 levels between psoriasis vulgaris and psoriasis with DM type 1 groups and healthy controls**

Index	Ps vulgaris with D1M group 2(n =40)	Healthy control group 2(n =40)	**P***
Il-6	94.54(13.12, 35.29)	15.88 (10.01,0.19)	0.0001
Il-12	72.44 (343.56,231,41)	18.67 (34.54,56.81)	0.0001

Psoriasis patients with type 1 diabetes showed that they had a significant increase in interleukin 6 concentrations compared to the negative subgroup of type 1 diabetes, in addition to an increase in the level of interleukin 12, but it wasnot to a significant extent .As shown in Table 3.

Table (4): Age distribution of control subjects and psoriasis patients.

Sex	Psoriasis patients(N=80)	Control (n=80)	*p-value*
Male	56	50	0.776
Female	24	30	0.865

No significant difference was found between the Sex for both studied groups.

Table (5) frequency distribution according to age

Age group	Psoriasis Vulgaris without DM type 1 (n=40)%	Psoriasis Vulgaris with DM type 1 (n=40)%	*P-value*
10 ≤	70.17%	50.67%	.0145
20-11	19.30%	29.33%	
30-21	7.02%	14.67%	
30<	3.51%	5.33%	

No significant differences were found between the two PV groups. (both P >0.001) and healthy controls (both P > 0.001) groups.

4- Discussion

As far as we are aware, no research has been published that compares the blood serum levels of interleukin 6 and interleukin 12 in psoriasis patients with and without type 1 diabetes. In the current study, psoriasis patients and the disease's subgroup—psoriasis patients with diabetes—showed substantially higher levels of interleukin 6 and interleukin 12 in comparison to controls.

Serum interleukin-6 levels were observed to be considerably greater in psoriasispatients with concomitant diabetes than in the type 1 diabetes-negative subgroup.Nonetheless, there was no big variation in interleukin 12 levels between the participants with psoriasis and those without type 1 diabetes.

Additionally, we found that psoriasis patients had higher quantities of interleukin 6 and interleukin 12 than did healthy individuals [Sera levels of Interleukin -6 in psoriatic patients in najaf city .[13].

Our research indicates that several studies have indicated a rise in the prevalence of diabetes among individuals with psoriasis .

Furthermore, a study of Chinese patients found that 4456 of psoriasis patientshad type 1 diabetes, compared to 6027 in the control group [14 [In contrast, just a few research have shown such a connection [12]. Chronic inflammation is linked to both diabetes and psoriasis because of TNF and other proinflammatorycytokines including IL-1 and IL-6 [15].

Interleukin 12 is also believed to have a role in development of psoriatic lesion [16]. And diabetes mellitus type 1 [17].

According to certain research using Ustekinumab (a monoclonal antibody) cantarget the component P40 shared by IL-12 and IL-23 as a result , it suppresses the signaling pathways for IL-17 and IFN-y , respectively [18].

Naïve T cells are differentiated into the TH1 phenotype by IL-12, and this phenotype is known to be implicated with T1D and Psoriasis [19].

Psoriasis patients may have elevated interleukin-6 concentrations because to Additional inflammation present in the body. Moreover, in psoriasis patients, interleukin-6 concentrations are linked to disease activity [20].

On the other hand, this kind of relationship has only been shown in a few of research.Therefore, in order to comprehend the connection between these two disorders, further scientific study has to be done.

5-Conclusions:

Psoriasis and diabetes are linked to interleukins 6 and 12, which can be utilized as indicators of possible inflammatory activity in these two disorders. To completely understand the underlying process and ascertain the significance ofthese interleukins in the development of psoriasis, further prospective investigations are required.

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