

Estimation of Serum Prolactin Level in Patients with Chronic Plaque Psoriasis and Their Association with Severity

Mohammed K. Al-Hattab, Al Hamza Warwar¹, Jinan H. Al-Kalidi¹

Department of Dermatology and Venerology, Hammurabi College of Medicine, University of Babylon, ¹Department of Dermatology and Venerology, Merjan Teaching Hospital, Babylon Health Directorate, Babylon, Iraq

Abstract

Background: Psoriasis is a polygenic, common, chronic, proliferative, and inflammatory condition of the skin, in which both hereditary and environmental factors play a basic role. Prolactin may enhance both humoral and cell-mediated immunity. Prolactin receptors are presented on the immune cells: T- and B-lymphocytes. Serum prolactin level may play a role in the etiopathogenesis of psoriasis. **Objectives:** The aim of this study was to compare serum prolactin levels in chronic plaque psoriatic patients with controls group and estimate correlation of their levels with disease severity. **Materials and Methods:** This case-control study was carried out in the dermatology department of Al-Najaf training center in Al-Sader Medical City, for the period from May 2020 to October 2021. A total of 40 patients (22 females and 18 males) with chronic plaque psoriasis and 40 controls (17 females and 23 males), older than 18 years, were subjected to investigations. The Psoriasis Area and Severity Index was identified for the patients that fit the inclusion and exclusion criteria, and serum prolactin levels were measured for the fasting patients and controls in the morning. **Results:** This study found that there were no significant differences in serum prolactin levels between psoriasis patients (mean 12.98) and healthy control group (mean 12.45) ($P = 0.518$). The mean differences in serum prolactin levels according to the severity of the disease showed no significant differences ($P = 0.166$). Also, the correlation between prolactin levels with age ($P = 0.795$) and duration of disease ($P = 0.461$) among patients with psoriasis was nonsignificant. The mean differences in prolactin levels according to the sex, among patients with psoriasis were significant between females (14.36 ng/mL) and males (11.28 ng/mL) ($P < 0.004$). **Conclusions:** This study showed that serum prolactin levels have no apparent role in pathogenesis of psoriasis disease and there was no correlation between serum prolactin levels with disease duration and severity.

Keywords: Psoriasis, serum prolactin, severity

INTRODUCTION

Psoriasis is a polygenic, common, chronic, proliferative, and inflammatory condition of the skin, associated with systemic manifestations in numerous organ systems. The genetic and environmental factors have an essential role in the etiology of psoriasis.^[1] In humans, many cell types have been involved in the initiation and maintenance of psoriatic lesions. Most of the epidermal T cells are CD8+, whereas the dermal cell is a mixture of CD4+ and CD8+ cells. Psoriatic T cells express $\alpha 1\beta 1$ integrin (VLA-1), which allows their interaction with basement membrane collagen IV and entrance into psoriatic epidermis.^[2] Keratinocytes also produce interleukin-1 β (IL-1 β), IL-6, and TNF- α that contribute to the activation of dendritic

cells.^[3] Tumor necrosis factor- α (TNF- α) is a principal player among proinflammatory cytokines, generated mostly via active macrophages, T-lymphocytes, and natural killer cells.^[4] Serum prolactin level may have a role in the etiopathogenesis of psoriasis. Psoriasis may worsen during the postpartum period, and this may be related to the physiological hyperprolactinemia associated with lactation. Also Bromocriptine, the

Address for correspondence: Dr. Jinan H. Al-Kalidi,
Department of Dermatology and Venerology,
University of Babylon, Babylon, Iraq.
E-mail: jinanhasan76@gmail.com

Submission: 08-Nov-2023 **Accepted:** 10-Jan-2024 **Published:** 30-Sep-2025

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Al-Hattab MK, Warwar A-H, Al-Kalidi JH. Estimation of serum prolactin level in patients with chronic plaque psoriasis and their association with severity. Med J Babylon 2025;22:837-43.

Access this article online

Quick Response Code:



Website:
<https://journals.lww.com/mjby>

DOI:
10.4103/MJBL.MJBL_1658_23

potent dopaminergic inhibitor of prolactin secretion, induced remission of psoriatic lesions.^[5] The body mass index was significantly increased in psoriatic patients when compared with the healthy control group and it increased in the severity of psoriasis, so the obesity is considered a comorbid for psoriatic patients.^[6] The aim of this study was to compare serum prolactin levels in chronic plaque psoriatic patients with controls group and estimate the correlation of their levels with disease severity.

MATERIALS AND METHODS

This case-control study was carried out in the Dermatology Department of Al-Najaf Training Center in Al-Sader Medical City, for the period from May 2020 to October 2021. This study included a total of 80 participants, divided into two groups:

- (A) Patient group of 40 persons, older than 18 years with chronic plaque psoriasis were included in this study, 18 males (45%) and 22 females (55.0%).
- (B) Control group comprised of 40 healthy controls, 23 males (57.5%) and 17 females (42.5%), older than 18 years, were included in this study. The control group had no history of any skin abnormalities or any chronic debilitating disease.

Inclusion criteria

Adult patients with chronic plaque psoriasis confirmed by Dermatologist, depending on clinical findings.

Exclusion criteria

- (1) Females with menstrual irregularity or in menopause.
- (2) Pregnant and lactating women.
- (3) Patients with prolactinoma, thyroid disease, and acromegaly.
- (4) Patients with liver failure, renal failure, and central nervous system tumors.
- (5) Patients with a medical history of epilepsy.
- (6) Patients on antidepressants and antipsychotic drugs.

- (7) Patients on drugs that may affect the serum prolactin levels like opioids, histamine 2 blockers, verapamil, or estrogens.
- (8) Patients with a history of malignancy.
- (9) Patients taking treatment for psoriasis in the last 2 months.

History and examination

History of names, ages, genders, duration of disease, past medical and surgical history, drug history, and obstetric history were collected from the participants. The Psoriasis Area and Severity Index (PASI) was identified, for the patient that fit the inclusion and exclusion criteria of the study by examining the erythema, induration, scales and sites of involvement, and classifying the patients into three categories according to PASI as follows:

- (1) Mild chronic plaque psoriasis < 10 PASI score
- (2) Moderate chronic plaque psoriasis 10–20 PASI score
- (3) Severe chronic plaque psoriasis >20 PASI score [Table 1]

Work

Approximately 1–2 mL of the venous blood were collected from the fasting participants in the morning (between 8:00 AM and 10:00 AM) and placed in a vacutainer tube. Then the blood was centrifuged to separate serum and collected 5–10 units from serum for (cobas e411) device that measured serum prolactin levels automatically in approximately 20 min. This device generally uses a sandwich principle by which prolactin is allowed to react with both a capture antibody, which is often fixed on a solid phase, and a labeled antibody which is used for detection. After that by the wash step remove the unreacted reagents and the signal generated is related to the amount of prolactin present.

Data analysis

Statistical analysis was carried out using SPSS version 25. Categorical variables were presented as frequencies and percentages. Continuous variables were presented as

Table 1: Calculation of the Psoriasis Area and Severity Index

	Head	Trunk	Upper limbs	Lower limbs
Severity of psoriatic lesion (0 = none, 1 = mild, 2 = moderate, 3 = severe, 4 = very severe)				
Erythema	0–4	0–4	0–4	0–4
Induration	0–4	0–4	0–4	0–4
Scaling	0–4	0–4	0–4	0–4
Total score = 1	Sum of above	Sum of above	Sum of above	Sum of above
Area of psoriatic involvement (0 = none, 1 = <10%, 2 = 10%–30%, 3 = 30%–50%, 4 = 50%–70%, 5 = 70%–90%, 6 = 90%–100%)				
Degree of involvement = 2	0–6	0–6	0–6	0–6
Correction factor = 3	0.1	0.3	0.2	0.4
1×2×3	A	B	C	D
PASI= A+B+C+D				

(means $\pm$ SD). Student *t* test was used to compare means between two groups, ANOVA test was used to compare means between three groups or more. Pearson's correlation coefficient (*r*) was used to find the relationship between two continuous variables. A *P* value of ≤ 0.05 was considered as significant.

Ethical approval

Ethical approval has been provided by the Scientific Council of Dermatology and Venerology-Arb Board of Medical Specialization. All participants in this study have been enlightened with signed consents. The data for this approval (May 2020 to October 2021).

RESULTS

This study included a total of 80 participants, divided into two groups:

- (A) patient group of 40 persons with chronic plaque psoriasis were included in this study, 18 males (45%) and 22 females (55.0%). The participants' age in this group ranged from 22 to 48 years, with the mean age of 33.83 years. They had been suffering from psoriasis for 10.30 ± 7.82 years.
- (B) control group comprised of 40 healthy controls, 23 males (57.5%) and 17 females (42.5%). The participants' age in this group ranged from 22 to 47 years, with the mean age of 32.70 years.

There were no significant differences between means of age according to study groups, *P* value = 0.505 as detailed in Table 2.

The distribution of patients with psoriasis according to the severity by PASI includes mild chronic plaque psoriasis (<10), moderate chronic plaque psoriasis (10–20), and severe chronic plaque psoriasis (>20). Less than half of patients ($N = 19$, 47.5%) presented with mild chronic plaque psoriasis (score < 10), ($N = 12$, 30.0%) of patients presented with moderate chronic plaque psoriasis (score 10–20), and ($N = 9$, 22.5%) of patients presented with severe chronic plaque psoriasis (score >20) as shown in Figure 1.

The mean differences in prolactin (ng/mL) according to the study groups including patients with psoriasis and control group. There were no significant differences between means of prolactin (ng/mL) according to study groups, *P* value = 0.518 as shown in Figure 2.

The mean differences in prolactin (ng/mL) were assessed across the study groups, including patients with psoriasis and control group for both males and females. There were no significant differences between means in prolactin (ng/mL) according to the study groups in both males and females, as shown in Figure 3.

The mean differences in prolactin (ng/mL) according to the severity of the disease including mild chronic plaque psoriasis (<10), moderate chronic plaque psoriasis (10–20), and severe chronic plaque psoriasis (>20) among patients with psoriasis. There were no significant differences between means in prolactin (ng/mL) according to the severity of the disease as detailed in Table 3.

The mean differences in prolactin (ng/mL) according to sex including males and females among patients with psoriasis. There were significant differences between means of prolactin (ng/mL) according to sex as detailed in Table 4 and Figure 4.

The correlation between prolactin (ng/mL) and study variables including (age and duration of disease) among patients with psoriasis. There was no significant correlation between prolactin (ng/mL) and age and duration of disease among patients with psoriasis as detailed in Table 5.

DISCUSSION

Psoriasis is a common, chronic, Proliferative, and inflammatory condition of the skin. The genetic and environmental factors have a basic role in the etiology of psoriasis.^[1]

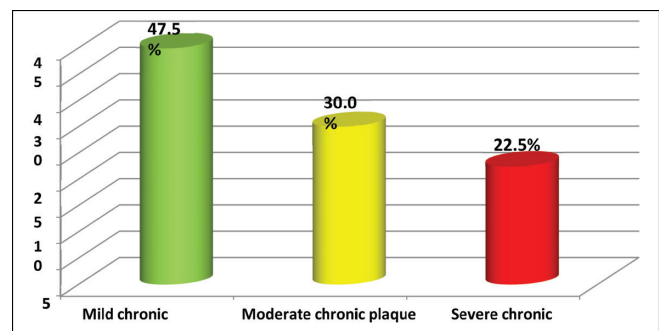


Figure 1: Distribution of patients according to Psoriasis Area and Severity Index ($N = 40$)

Table 2: The mean differences in age according to the studied groups

Study Variables	Study group	N	Mean	SD	t test	P value*
Age (years)	Patients with psoriasis	40	33.83	8.05	0.67	0.505
	Control group	40	32.70	6.92		

**P* value ≤ 0.05 was significant

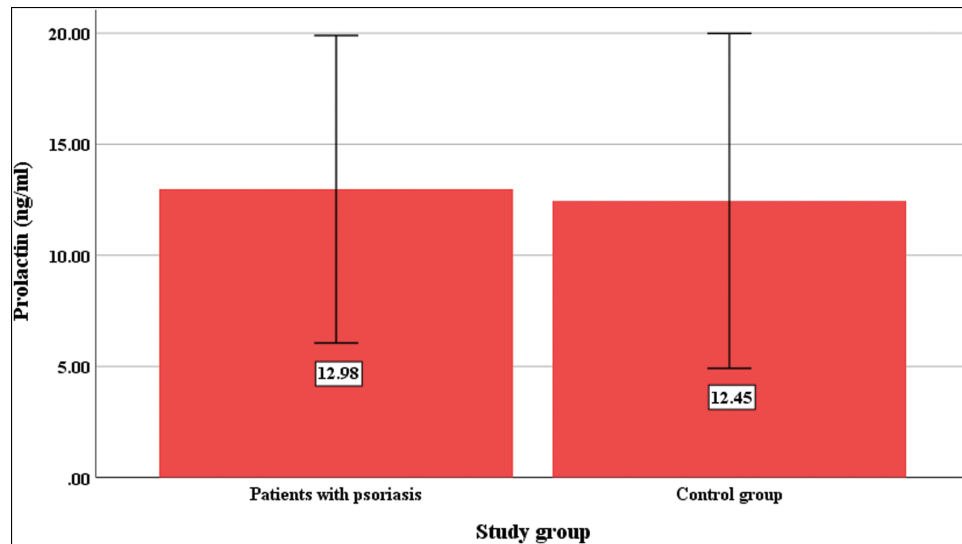


Figure 2: The mean differences in prolactin (ng/mL) according to the study groups (patients and controls; $N = 80$)

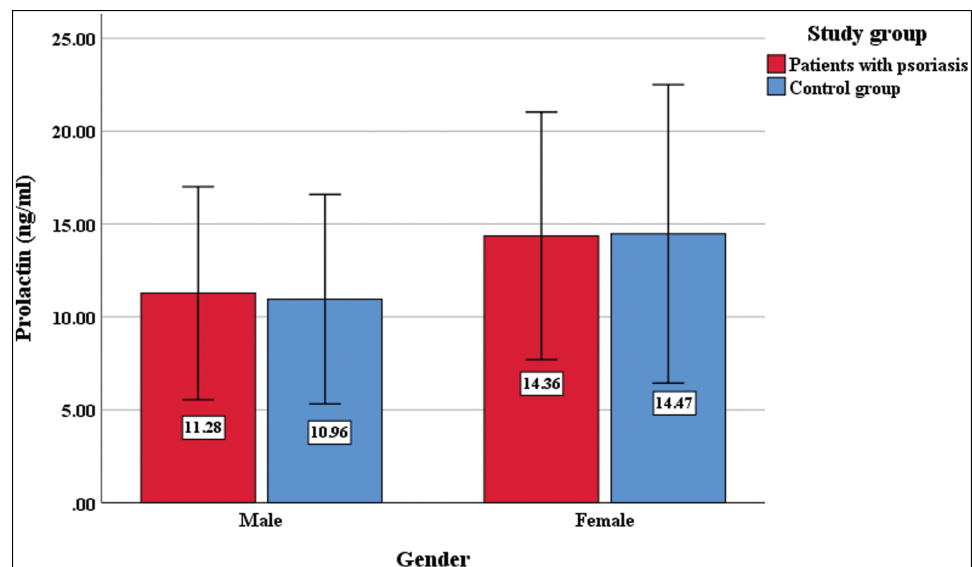


Figure 3: The mean differences in prolactin (ng/mL) according to the study groups (males and females; $N = 80$)

Table 3: The mean differences in prolactin (ng/mL) according to severity of disease ($N = 40$)

Study variables	Study group	N	Mean	SD	F	P value*
Prolactin (ng/mL)	Mild chronic plaque psoriasis (<10)	19	13.05	2.87	1.883	0.166
	Moderate chronic plaque psoriasis (10–20)	12	11.66	4.03		
	Severe chronic plaque psoriasis (>20)	9	14.55	3.46		
Prolactin (ng/mL) among males ($N = 18$)	Mild chronic plaque psoriasis (<10)	9	11.77	2.94	1.775	0.203
	Moderate chronic plaque psoriasis (10–20)	6	9.66	2.87		
	Severe chronic plaque psoriasis (>20)	3	13.00	1.00		
Prolactin (ng/mL) among females	Mild chronic plaque psoriasis (<10)	10	14.20	2.39	0.374	0.693
	Moderate chronic plaque psoriasis (10–20)	6	13.66	4.22		
	Severe chronic plaque psoriasis (>20)	6	15.33	4.08		

* P value ≤ 0.05 was significant

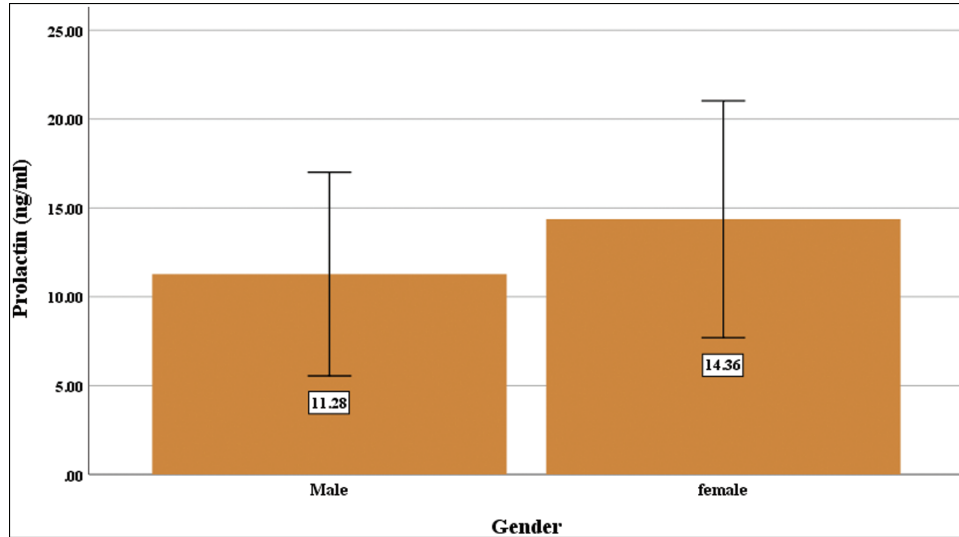
Prolactin has a wide range of functions including lactation and production of milk, osmoregulation, metabolism, and regulation of both the immune and the nervous systems.^[7]

PRL promotes IFN- γ -stimulated transcription and secretion of CXCL9, CXCL10, and CXCL11 enhancing the infiltration of type 1 T-helper cells into psoriatic lesions.^[8]

Table 4: The mean differences in prolactin (ng/mL) according to sex (N = 40)

Study variables	Sex	N	Mean	SD	t test	P value
Prolactin (ng/mL)	Male	18	11.28	2.86	-3.10	0.004*
	Female	22	14.36	3.33		

*P value ≤ 0.05 was significant

**Figure 4: The mean differences in prolactin (ng/mL) according to sex (N = 40)****Table 5: The correlation between prolactin and study variables including (age and duration of disease) among patients with psoriasis**

Type of patients	Study variables	N	Mean	SD	r	P value*
Total patients (N = 40)	Age (years)	40	33.82	8.05	-0.042	0.795
	Prolactin (ng/mL)	40	12.97	3.46		
	Duration of disease (years)	40	10.30	7.82	-0.12	0.461
	Prolactin (ng/mL)	40	12.97	3.46		
Male patients (N = 18)	Age (years)	18	34.11	8.99	0.038	0.882
	Prolactin (ng/mL)	18	11.27	2.86		
	Duration of disease (years)	18	11.22	9.46	-0.152	0.547
	Prolactin (ng/mL)	18	11.27	2.86		
Female patients (N = 22)	Age (years)	22	33.59	7.40	-0.09	0.69
	Prolactin (ng/mL)	22	14.36	3.33		
	Duration of disease (years)	22	9.54	6.30	-0.012	0.957
	Prolactin (ng/mL)	22	14.36	3.33		

*P value ≤ 0.05 was significant

This study was planned to assess serum prolactin levels in patients with psoriasis and their relation to the duration and severity of the disease. There are several studies about correlations between serum prolactin levels and psoriasis disease and it is duration and severity. Some of them found a significant correlation whereas the others did not.

Robati *et al.*^[9] measured prolactin level in 30 patients with psoriasis before and after treatment, and 30 controls. Their results showed no significant differences between psoriasis patients before the treatment and healthy controls, and no association between prolactin levels

with the severity of psoriasis was observed but there was a significant decrease in serum prolactin levels after treatment.

Yavuz *et al.*^[10] estimated serum prolactin levels in 34 patients with psoriasis and 21 normal control subjects. There was no significant difference between the two groups in serum prolactin levels.

Handjani *et al.*^[11] measured serum prolactin levels in 90 persons in cross-sectional case-control study. The persons were divided into three groups: psoriatic patients, atopic

dermatitis patients, and a control group. The result showed no significant difference between patients with psoriasis vulgaris and atopic dermatitis and the control group in the serum prolactin levels (P value = 0.604) and an association between prolactin level and the severity of psoriasis was observed. Also, there was no correlation between the age of the patients in the psoriasis group and serum prolactin levels.

Toossi *et al.*^[12] evaluated the serum levels of, selenium, prolactin, and osteopontin in 40 chronic plaque-type psoriasis patients and 40 controls. The result showed no significant difference between psoriasis and control groups in serum prolactin levels.

Dilmé-Carreras *et al.*^[13] measured Serum prolactin levels in 20 patients with plaque-type psoriasis and 20 healthy controls. Their results showed that serum prolactin levels that were significantly higher in the psoriasis group compared with the control group ($P < 0.001$).

Keen *et al.*^[14] investigated 60 patients of psoriasis and 60 controls for serum prolactin levels. The results showed psoriatic patients had Serum prolactin levels were significantly higher than that of the control group (P value = 0.002) and no correlation between serum prolactin levels and the duration of disease was seen (P value = 0.954).

Elsherif *et al.*^[15] evaluated the serum prolactin levels in 25 patients with psoriasis, 25 patients with vitiligo, 25 patients with alopecia areata, and 25 healthy controls. Their results showed that serum prolactin of psoriasis patients was significantly higher than that of healthy controls. Also, serum prolactin levels increase with increased severity and duration of disease ($P < 0.05$).

In the present study, 40 patients with chronic plaque psoriasis were compared with 40 controls who were matched regarding age and sex. The study demonstrated that, regarding serum prolactin levels, there were no significant differences between psoriasis patients (mean 12.98) and healthy control groups (mean 12.45) ($P = 0.518$). These results were consistent with Yavuz *et al.*^[10] and Toossi *et al.*^[12] and this correlation further supports that no role for serum prolactin levels in psoriasis disease.

In contrast, a number of studies have found a significant correlation between serum prolactin and psoriasis disease such as Dilmé-Carreras *et al.*^[13] and Keen *et al.*^[14] In this study, the mean differences in serum prolactin levels according to the severity of the disease showed no significant differences ($P = 0.166$). This result was consistent with the results of Robati *et al.*^[9] and Handjani *et al.*^[11] On the other hand Maryam *et al.*^[16] was found statistically significant relation between serum prolactin levels and severity of disease ($P = 0.003$).

In our study, regarding the correlation between prolactin levels with age ($P = 0.795$) and duration of disease ($P < 0.461$) among patients with psoriasis, found no significant

correlation between them witch consistent with the result of Handjani *et al.*^[11] and Keen *et al.*^[14] but differed from the result of Elsherif *et al.*'s^[15] study that found serum prolactin levels increased with increased duration of disease ($P = 0.05$).

The mean differences in prolactin levels in our study according to sex among patients with psoriasis showed significant differences between means of prolactin levels in females (14.36) and males (11.28) ($P < 0.004$).

Because serum prolactin levels may change throughout the day, the difference in serum prolactin levels between patients and controls in different studies may be attributed to that some studies did not mention the time of collection of blood samples. Also, the psychological stress that occurs in patients with psoriasis may affect the level of serum prolactin level.^[17]

However, the role of prolactin in many autoimmune diseases has been approved but the role in psoriasis disease is controversial. An expanded study with a larger sample size of both psoriasis patients and controls is recommended for further evaluation of the relationship between psoriasis disease and serum prolactin levels.^[18-19]

CONCLUSION

This study showed that serum prolactin levels have no apparent role in pathogenesis of psoriasis disease and there was no correlation between serum prolactin levels with disease duration and severity.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Burden AD, Kirby B. Psoriasis and related disorders. In: Griffiths C, Barker J, Bleiker T, Chalmers R, Creamer D, editors. Rook's Textbook of Dermatology. 9th ed. New Delhi: John Wiley & Sons; 2016. p. 35.1-48.
2. Bonish B, Jullien D, Dutronc Y, Huang BB, Modlin R, Spada FM, *et al.* Overexpression of CD1d by keratinocytes in psoriasis and CD1ddependent IFN-gamma production by NK-T cells. *J Immunol* 2000;165:4076-85.
3. Ganguly D, Chamilos G, Lande R, Gregorio J, Meller S, Facchinetti V, *et al.* Self-RNAantimicrobial peptide complexes activate human dendritic cells through TLR7 and TLR8. *J Exp Med* 2009;206:1983-94.
4. AL Mayah QS, Nayyef UA, Hassan JS. Association of TNF-308G/A Gene polymorphism with coronavirus disease-19 severity. *Med J Babylon* 2023;20:54.
5. de Moura C, de Assis L, Paulo G, Fabiana R. A case of acute generalized pustular psoriasis of von zumbusch triggered by hypocalcemia. *Case Rep Dermatol* 2015;7:345-51.
6. Al-Saba AH, Shemran KA, Al-Hattab MK. Study of serum chitinase-3 like-1 protein (CH3L1) and C-reactive protein (CRP) in patients suffering from chronic plaque psoriasis. *Med J Babylon* 2022;19:729.

7. Phillipps HR, Yip SH, Grattan DR. Patterns of prolactin secretion. *Mol Cell Endocrinol* 2020;502:110679.
8. Kanda N, Shinichi W. Prolactin enhances interferon- γ - induced production of CXCL9, CXCL10, and CXCL11 in human keratinocytes. *Endocrinology* 2007;148:2317-25.
9. Robati RM, Toossi P, Rahmati-Roodsari M, Khalilazar S, Abolhasani E, Namazi N, *et al.* Association of psoriasis severity with serum prolactin, thyroid hormones, and cortisol before and after treatment. *Sci World J* 2013;2013:1-5.
10. Yavuz O, Kavak A, Haidar A, Parlack HA, Ayadogan I. The role of prolactin in psoriasis [Psoriasisde prolaktinin rolü]. *Turk Arch Dermatol Venerol* 2002;36:263-7.
11. Handjani F, Saki N, Ahrari I, Ebrahimi M, Khorrami MM, Nematollahi P. Serum prolactin levels in psoriasis vulgaris. *ISRN Dermatol* 2014;2014:586049.
12. Toossi P, Sadat Amini SH, Sadat Amini MS, Partovi Kia M, Enamzade R, Kazeminejad A, *et al.* Assessment of serum levels of osteopontin, selenium and prolactin in patients with psoriasis compared with healthy controls, and their association with psoriasis severity. *Clin Exp Dermatol* 2015;40:741-6.
13. Dilmé-Carreras E, Martín-Ezquerro G, Sánchez-Regaña M, Umbert-Millet P. Serum prolactin levels in psoriasis and correlation with cutaneous disease activity. *Clin Exp Dermatol* 2011;36:29-32.
14. Keen MA, Hassan I. Serum prolactin levels in psoriasis and its association with disease activity: A case-control study. *Indian J Dermatol* 2014;59:562-6.
15. Elsherif NA, El-Sherif AI, El-Dibany SA. Serum prolactin levels in dermatological diseases: A case-control study. *J Dermatol Dermatolog Surg* 2015;19:104-7.
16. Maryam A, Mojtaba M, Mehdi A, Raheb G. Does prolactin indicate severity of psoriasis? *Iran J Dermatol* 2009;12:79-81.
17. Kader AI, Ghazi MA. Understanding the correlation between clinical severity of psoriasis and quality of life among patients with psoriasis. *Hilla University College J Med Sci* 2025;3(2):15-24. DOI: <https://doi.org/10.62445/2958-4515.1057>
18. Al-Hattab MK, Nahi NH, Al-Kalidi JH. Evaluation of oxidative stress in cutaneous leishmaniasis in Iraqi patients. *Med J Babylon* 2024;21(3):538-43.
19. Al-Maamori MK, Altaee ZM, Naj NM, Hussien RS. Staphylococcal scalded skin syndrome (SSSS): A short review. *Hilla University College J Med Sci* 2025;3(1):Article 5. DOI: <https://doi.org/10.62445/2958-4515.1048>