

## Prevalence of Menstrual Irregularities in Women with Psoriasis Taking Systemic Medications

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**Abstract: Background:** A prevalence of menstruation irregularities in patients with psoriasis taking systemic therapy was a complex issue that depends upon a variety of factors, which include the type of drug utilized and the unique characteristics of every patient, where certain systemic treatments may make menstruation problems worse, while others can assist with reproductive health.

**Objective:** Our study contributed to assess all the clinical outcomes of the effect of menstrual irregularities in women with psoriasis who are taking systemic medication. **Methods:** All 77 Iraqi women were having psoriasis along with menstrual disorders who were undergoing systemic therapy were enrolled in the study. Also, demographic and clinical information of the participants was obtained from different hospitals in Iraq, where the follow-up period spanned from January 2023 to January 2024, with a duration of one year. In addition, the outcomes of the women with psoriasis were documented, along with the menstrual cycle data and its impact on their lives. The menstrual symptoms, duration, and impact on patients' lives were evaluated. **Results:** Our outcomes enrolled a total of 77 women diagnosed with menstrual irregularities and psoriasis, with the objective of investigating the correlation between these conditions and various clinical outcomes, which determine all factors, including smoking (36.36%), obesity (51.95%), medical history (27.27%), and systemic medications such as oral contraceptives (76.62%), were associated with an increased risk of adverse outcomes. Moreover, postmenopausal hormone therapy regimens, comprising estrogen monotherapy (40.26%) and estrogen plus progestin (25.97%), were also analyzed, where the severity of symptoms had an effect on menstruation, with a mean value of  $7.21 \pm 0.33$ . **Conclusion:** According to the study, there can be a connection between women's risk for psoriasis and hormonal variables such as irregular menstrual cycles and surgical menopause, which could affect menstrual health and make it difficult to assess the effects of medications.

**Keywords:** Menstrual irregularities; Women; Psoriasis; Systemic medications; and hormone.

### INTRODUCTION

Over 125 million people worldwide suffer with psoriasis, an immune-related chronic systemic illness which impacts roughly 1.5–3% of the Western population [Griffiths, C. E. *et al.*, 2007; Lowes, M. A. *et al.*, 2007; Nestle, F. O. *et al.*, 2009; Gelfand, J. M. *et al.*, 2009]. In the general population, psoriasis can be associated with high rates of morbidity as well as huge financial costs. The cause of this condition remains unclear despite its great prevalence [Gelfand, J. M. *et al.*, 2006; Neimann, A. L. *et al.*, 2006; Javitz, H. S. *et al.*, 2002]. Understanding psoriasis's modifiable risk factors is essential for preventing the condition and its detrimental effects on health [Gunnarsson, C. *et al.*, 2012; Gilliver, S. C. *et al.*, 2003; Shah, M. G. *et al.*, 2001]. There haven't been many prospective studies evaluating the relationship between psoriasis incidence and modifiable factors. [Pennell, L. M. *et al.*, 2012; Murase, J. E. *et al.*, 2005]

Sex steroid hormones, in specific, have been found to have a range of biological along with

immunological impacts on the skin [Raychaudhuri, S. P. *et al.*, 2003; Swanbeck, G. *et al.*, 1994; Brenaut, E. *et al.*, 2013]. Previous studies indicate that estrogen is related to improved barrier function, improved wound healing, and improvements in skin thickness and collagen/dermal water levels [Ahdout, J. *et al.*, 2012; Wu, S. *et al.*, 2014]. Given that a variety of autoimmune disorders are more common in women than in men, gonadal hormones may play a part with this sex difference. [Cenci, S. *et al.*, 2000; Vegeto, E. *et al.*, 2003; Jansson, L. *et al.*, 1990]

The normal progression of psoriasis in women is altered by pregnancy and menopause, indicating that female hormones regulate skin inflammation [Blank, M. *et al.*, 1990; Straub, R. H. *et al.*, 2007; Steinberg, A. D. *et al.*, 1979]. When compared to pre-pregnancy, psoriasis has been demonstrated to improve during pregnancy, and this improvement is associated with elevated levels of estrogen but not progesterone rates [Schmidt, M. *et al.*, 2009].

The risk for psoriasis may be linked to hormonal variables. [Lamb, S. R. *et al.*, 2004]

## II. METHODOLOGY

A cross-sectional study was conducted on Iraqi women suffering from psoriasis who also experienced menstrual disorders, with all participants receiving systemic medications. The data were collected from female patients whose ages ranged between 20 and 45 years, and the data were obtained from different hospitals in Iraq during the period from January 2023 to January 2024. The demographic data of Iraqi women included age, body mass index, comorbidities, smoking, socioeconomic status, education, and socioeconomic status. The inclusion and exclusion criteria were as follows: 1) women aged 20-45 years; 2) smokers and obese women; 3) women with psoriasis who suffer from menstrual disorders; 4) women with medical conditions (hypertension, diabetes, asthma, anemia); and 5) women taking systemic medications. The exclusion criteria were: 1) women younger than 20 years and older than 45 years; 2) women with cancerous medical conditions that affect the menstrual cycle; 3) women who had undergone previous surgeries; and 4) women who had previous surgical infections. All statistical analyses

were performed on all women's outcomes using the SPSS program, version 22.0.

Furthermore, the present study documented medical data pertaining to menstrual disorders in women during pregnancy and menstruation. The parameters encompassed menstrual regularity, categorized as (regular, usually irregular, and always irregular), in addition to menstrual regularity in adulthood, categorized as (regular, usually irregular, and always irregular). The clinical results determined the symptoms and duration of symptoms, and a questionnaire was used to assess the severity of the different menstrual symptoms that women suffer from. The Menstrual Symptom Questionnaire (MSQ) represents the range of this scale from 0 to 10, where 0 shows no symptoms in women, while 10 represents the bad impact on women's lives.

Furthermore, the study determined the menopausal status of women, categorized according to the Menopausal Symptom Questionnaire (MSQ). The study's findings revealed the identification of reproductive factors in women, along with the extent of the influence of exogenous hormones and oral contraceptives used by women with psoriasis.

## III. RESULTS

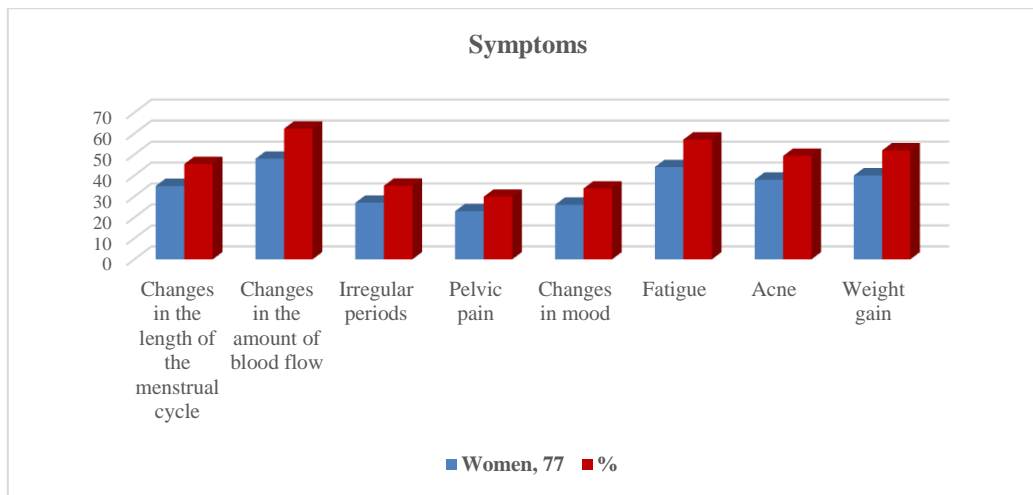
**Table 1:** Baseline Demographic Features of Women With Psoriasis

Features	Women, 77	Percentage, %
Age		
< 30	23	29.87%
≥ 30	54	70.13%
Body mass index, BMI, kg/m <sup>2</sup>		
< 26	20	25.97%
26 – 30	40	51.95%
> 30	17	22.08%
Comorbidity		
Hypertension	31	40.26%
Diabetes	18	23.38%
Asthma	18	23.38%
Anemia	6	7.79%
Others	4	5.19%
Smoking status		
No	49	63.64%
Smokers	28	36.36%
ASA, %		
I	27	35.06%
II	37	48.05%
III	13	16.88%
Family history		
Yes	21	27.27%
No	56	72.73%

Marital status		
Single	20	25.97%
Married	37	48.05%
Divorced	15	19.48%
Widow	5	6.49%
Occupation status		
Housewife	26	33.77%
Employer	51	66.23%
Education level		
Primary	16	20.78%
Secondary	24	31.17%
High	37	48.05%
Economic status, \$		
Low, 200 - 500	24	31.17%
Moderate, 501 - 800	33	42.86%
High, > 800	20	25.97%

**Table 2:** Enroll Menstrual Irregularities Data At Patients

Variables	N = 77	%
Menstrual cycle regularity		
Regular	58	75.32%
Usually, irregular	12	15.58%
Always irregular	7	9.09%
Menstrual cycle regularity in adulthood		
Regular	56	72.73%
Usually, irregular	16	20.78%
Always irregular	5	6.49%



**Figure 1:** Enrollment Menstrual Irregularities Symptoms Related To Women Psoriasis

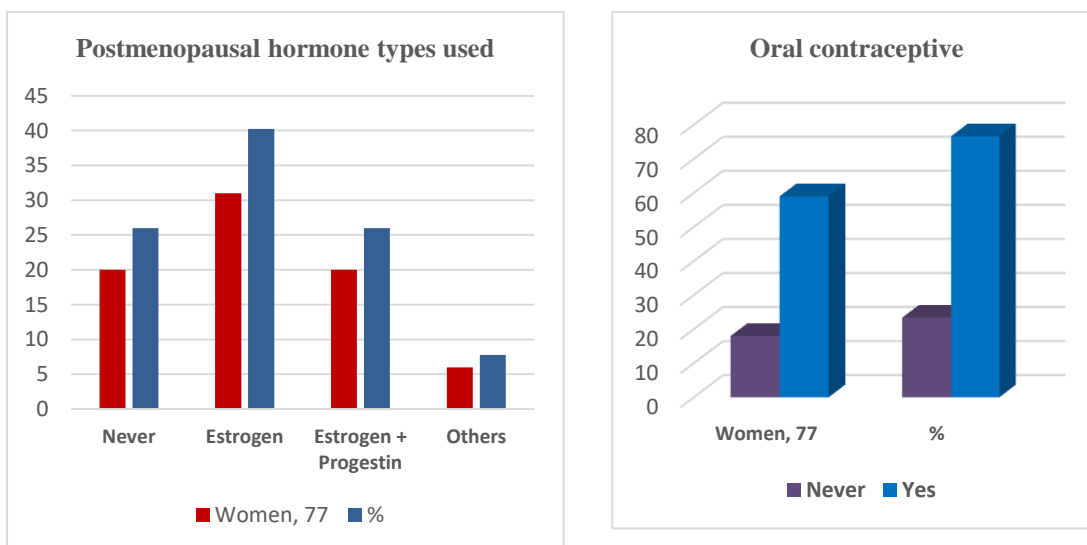
**Table 3:** Identify Menopause Status Outcomes

Items	Women, 77	%
<b>Menopause status</b>		
Pre-menopause	33	42.86%
Post-menopause	44	57.14%
<b>Type of menopause</b>		
Natural menopause	35	45.45%
Surgical menopause	42	54.55%
<b>Age at menopause</b>		
<30 years	26	33.77%

40–40 years	41	53.25%
41–45 years	10	12.99%
<b>Age at natural menopause</b>		
<30 years	32	41.56%
40–40 years	34	44.16%
41–45 years	11	14.29%
<b>Length of ovulatory life</b>		
<35 years	15	19.48%
35–40 years	36	46.75%
≥40 years	26	33.77%

**Table 4:** Determining Reproductive Factors In Women With Psoriasis

Variables	Participants, 77	%
<b>Nulliparous</b>		
Yes	15	19.48%
No	62	80.52%
<b>Age at first birth</b>		
< 20 years	11	14.29%
20 - 25	53	68.83%
> 25 years	13	16.88%
<b>Age at last birth</b>		
< 25 years	8	10.39%
25–30 years	57	74.03%
≥ 35 years	12	15.58%
<b>Parity</b>		
1	11	14.29%
≥ 2	60	77.92%
≥ 4	6	7.79%
<b>Breastfeeding duration</b>		
None	23	29.87%
1–7 months	16	20.78%
8–13 months	12	15.58%
14–22 months	16	20.78%
≥ 23 months	10	12.99%



**Figure 2:** Identify Exogenous Hormone And Oral Contraceptives Used In Women With Psoriasis

**Table 5:** A Conducting Menstrual Symptom Questionnaire (Msq) In Women with Psoriasis

Items	MSQ scores
Changes in the length of the menstrual cycle	7.21 ± 0.33
Changes in the amount of blood flow	5.62 ± 0.10
Irregular periods	6.02 ± 1.00
Pelvic pain	4.60 ± 0.40
Changes in mood	5.30 ± 0.29
Fatigue	5.64 ± 1.01
Acne	5.88 ± 1.82
Weight gain	8.01 ± 0.15

#### IV. DISCUSSION

Our investigation provided the first detailed examination of the association among women's potential for incident psoriasis and hormonal variables. We discovered that surgical menopause and an always irregular menstrual cycle among Iraqi women might be related to a slightly elevated prevalence of psoriasis in women, even after controlling additional psoriasis risk factors and possible confounders.

T-cell-mediated keratinocyte hyperproliferation and inflammatory processes are hallmarks of psoriasis [Leylek, O. A. *et al.*, 1997]. The inflammatory cascade activates innate immune cells, such as macrophages and dendritic cells, which release inflammatory chemical signals. However, estrogen has a complex role in inflammation [Shelley, W. B. *et al.*, 1995]. In a number of animal models of long-term inflammatory disorders, such as arthritis, estrogen has been demonstrated to decrease inflammation and limit bone resorption. However, in certain chronic autoimmune diseases that affect women, estrogen can also have pro-inflammatory effects. [Cutolo, M. *et al.*, 2010]

Precursor estrogens are converted for proinflammatory metabolites, especially in rheumatoid arthritis synovial cells, which primarily produce the PR proliferative agent (16 $\alpha$ OH-estrone), which does not inhibit TNF secretion, according to a recent study that looked at the downstream processing of estrogens in synovial cells in women with arthritis [Cutolo, M. *et al.*, 2012]. In particular, it has been shown that utilizing HT or estrogen could cause or worsen inflammatory skin conditions such as eczema and contact allergies [Oertelt-Prigione, S. *et al.*, 2012]. As a result, in recent years, estrogens have been thought to boost humoral immune response and cell proliferation [Case, A. M. *et al.*, 1998]. Additional study is required to confirm the possible elevated risk of psoriasis caused by

hormone usage, given the study's findings about the borderline association between current HT use as well as psoriasis risk. [Arruvito, L. *et al.*, 2007]

Furthermore, we found possible correlations among the risk of psoriasis, surgical menopause, and regular menstruation in adulthood [Hunter, D. J. *et al.*, 1997]. The immune system and the development for autoimmune diseases, along with other diseases, are impacted by hormonal alterations occurring through the menstrual cycle. Over the course of the 4-week cycle, the menstrual cycle may have an impact on the quantity and activity of immune cells. [Colditz, G. A. *et al.*, 1987]

The menstrual cycle-related changes in chronic conditions may also be explained by sudden changes in the concentrations of circulating ovarian steroids that ovulation and premenstrual [Dominguez, P. L. *et al.*, 2009]. These changes may be explained by baseline inflammation and immune cell activation in conjunction with other mechanisms, including regulation of receptor expression, modulation of muscular contraction, and behavioral aspects. [Wu, S. *et al.*, 2014]

#### V. CONCLUSION

In conclusion, the findings of our study point to some possible links between women's risk of developing psoriasis and hormonal factors, like adult menstrual cycle irregularities and surgical menopause. Menstrual irregularities in women having psoriasis may also be caused by hormonal variations, resulting in evaluating the effects of medications more difficult. Menstrual health may be impacted by systemic therapy for psoriasis. However, the degree and kind of these symptoms might differ significantly from individual to individual.

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