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CUTANEOUS MANIFESTATIONS OF POLYCYSTIC OVARIAN SYNDROME IN BABYLON CITY

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ABSTRACT

Background: Polycystic ovarian syndrome (PCOS) is the most prevalent endocrine disorder among reproductive-age females globally. Cutaneous signs often represent the first symptoms of PCOS, making them essential for diagnosis. **Aim of Study:** This study investigated the dermatological manifestations associated with PCOS and compared their prevalence in women with PCOS to that in a control group. **Patients and Methods:** This is a case control study that included 100 patients with PCOS along with 100 women as healthy controls and was conducted in Babylon, Iraq during the period from 8/1/2024 to 21/8/2024. **Results:** Hirsutism was the most common dermatological manifestation among patients with PCOS (89%), followed by acne (76%), acanthosis nigricans (58%), chronic telogen effluvium (47%), androgenic alopecia (38%), recurrent boils (18%), melasma (15%). **Conclusion:** Hirsutism, acne, acanthosis nigricans, chronic telogen effluvium, and androgenic alopecia were significantly more prevalent in PCOS patients compared to controls, highlighting the importance of dermatological signs in PCOS diagnosis. While hidradenitis suppurativa did not reach statistical significance, the borderline p-value suggests a potential association warranting further investigation. Early diagnosis and management of dermatological symptoms, alongside hormonal and metabolic considerations, are crucial for improving the quality of life for women with PCOS.

KEYWORDS: Cutaneous signs often represent the first symptoms of PCOS, making them essential for diagnosis.

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is the most prevalent endocrine disorder among reproductive-age females globally. The frequency varies from 5% to 15%, depending upon the diagnostic criteria used.[1] Diagnosis is based on Rotterdam criteria, which is based on the presence of two of the following: oligoovulation and/or anovulation (<8 menses per 12≥month period), hyperandrogenism (clinical or laboratory), and polycystic ovaries on ultrasound (≥12 follicles in each ovary measuring 2–9 mm in diameter and/or increased ovarian volume >10 ml).[2]

The diagnosis is one of exclusion, necessitating the elimination of illnesses that replicate the clinical characteristics of PCOS. These include thyroid disorders, hyperprolactinemia, and non-classical congenital adrenal hyperplasia. Patients selected may need a more comprehensive evaluation if clinical manifestations indicate other etiologies. Despite its widespread occurrence, PCOS is often underdiagnosed, often requiring many consultations with various doctors over a period beyond one year for proper identification.[3]

Cutaneous signs often represent the first symptoms of PCOS, making them essential for diagnosis. Research indicates that these symptoms may manifest before to other systemic indicators, such monthly abnormalities or infertility. For example, hirsutism and acne may prompt women to get medical consultation sooner than other symptoms.[4]

Furthermore, the existence of certain dermatological diseases might assist physicians in conducting hormonal evaluations to validate a diagnosis. Hormonal abnormalities linked to PCOS, including increased testosterone levels, often correspond with these dermatological symptoms.[5]

The psychosocial implications of cutaneous manifestations are significant. Conditions like hirsutism and severe acne can lead to emotional distress, social

anxiety, and decreased quality of life. Understanding this aspect reinforces the importance of early diagnosis and comprehensive management that includes psychological support.[6]

This study investigated the dermatological manifestations associated with PCOS and compared their prevalence in women with PCOS to that in a control group.

PATIENTS AND METHODS

Study design and setting

This is a case control study that included 100 patients with PCOS along with 100 women as healthy controls and was conducted in Babylon, Iraq during the period from 8/1/2024 to 21/8/2024.

Inclusion criteria

Fulfillment of Rotterdam criteria for the diagnosis of PCOS (for cases group).
Age between 18 and 45 years.

Exclusion criteria

Pregnancy or breastfeeding.
Use of hormonal therapies (e.g., oral contraceptives, antiandrogens) within the past 6 months.
Presence of other endocrine disorders that can mimic PCOS or affect cutaneous manifestations (e.g., thyroid disease, congenital adrenal hyperplasia).
Use of medications known to cause hirsutism or other skin changes (e.g., phenytoin, minoxidil).
History of skin conditions unrelated to PCOS that could confound the assessment of cutaneous manifestations (e.g., psoriasis, eczema).

Informed agreement was acquired from each participant, followed by a comprehensive dermatological history and examination for each case. The hormonal profile was conducted on the second day of spontaneous menstruation, including luteinizing hormone (LH), total, follicle stimulating hormone (FSH), free testosterone, thyroid stimulating hormone (TSH), and prolactin. An LH/FSH ratio over two was regarded as abnormal. Abdominal ultrasonography was performed as a component of the diagnostic criteria for polycystic ovary syndrome (PCOS).

Data entry was done using Microsoft Excel 2019. Analysis was done using statistical package for social sciences (SPSS version 26). Independent sample t-test was used to compare continuous values. Fischer's exact test was used for categorical values. A two-tailed p value of less than or equal to 0.05 was assigned as a criterion for declaring statistical significance.

RESULTS

Table 1 shows that no significant difference was detected between both study groups regarding age. Patients with PCOS had significantly higher BMI than controls.

Table 1: Comparison of basic characteristics between both study groups.

Parameter	PCOS, n=100	Controls, n=100	P value
Age			
Mean ± SD	26.3 ± 6.3	25.5 ± 7.4	0.538
BMI			
Normal weight	24	51	<0.001
	24.0%	51.0%	
Overweight	53	38	
	53.0%	38.0%	
Obese	23	11	
	23.0%	11.0%	
Mean ± SD	29.4 ± 5.2	25.8 ± 4.6	

Comparison of hormonal panel between both study groups shows that patients with PCOS had significantly higher levels of LH, TSH, and free testosterone than controls; as illustrated in Table 2.

Table 2: Comparison of hormonal panel between both study groups.

Parameter	PCOS	Controls	P value
LH (IU/mL)	10.3 ± 3.4	4.5 ± 1.1	<0.001
FSH (IU/ml)	5.4 ± 0.8	5.8 ± 1.2	0.426
Prolactin (ng/ml)	16.6 ± 5.7	11.3 ± 2.5	0.073
TSH (mIU/L)	3.2 ± 1.1	2.3 ± 0.6	<0.001
Free testosterone (nmol/L)	1.38 ± 0.6	0.6 ± 0.4	<0.001
HOMA-IR	3.5+1.6	3.2+1.4	0.315

Hirsutism was the most common dermatological manifestation among patients with PCOS (89%), followed by acne (76%), acanthosis nigricans (58%), chronic telogen effluvium (47%), androgenic alopecia

(38%), recurrent boils (18%), melasma (15%). Hiradenitis suppurativa was not found to be significantly associated with PCOS (P= 0.065).

Table 3: Comparison of cutaneous manifestation between both study groups.

Parameter	PCOS, n=100	Controls, n=100	P value
Hirsutism			
Present	89	5	<0.001
	89.0%	5.0%	
Absent	11	95	
	11.0%	95.0%	
Acne			
Present	76	40	<0.001
	76.0%	40.0%	
Absent	24	60	
	24.0%	60.0%	
Acanthosis nigricans			
Present	58	12	<0.001
	58.0%	12.0%	
Absent	42	88	
	42.0%	88.0%	
Androgenic alopecia			
Present	38	11	<0.001
	38.0%	11.0%	
Absent	62	89	
	62.0%	89.0%	
Hidradenitis suppurativa			
Present	7	1	0.065
	7.0%	1.0%	
Absent	93	99	
	93.0%	99.0%	
Striae			
Present	65	35	<0.001
	65.0%	35.0%	
Absent	35	65	
	35.0%	65.0%	
Recurrent boils (Staphylococcus aureus)			
Present	18	7	0.031
	18.0%	7.0%	
Absent	82	93	
	82.0%	93.0%	
Melasma			
Present	28	15	0.038
	28.0%	15.0%	
Absent	72	85	
	72.0%	85.0%	
Chronic telogen effluvium			
Present	47	30	0.020
	47.0%	30.0%	
Absent	53	70	
	53.0%	70.0%	

DISCUSSION

The present study showed that hirsutism was the most common cutaneous manifestation of PCOS, followed by acne. This is similar to Aljefri et al. showed that cutaneous manifestations were commonly in the form of hirsutism (47.3%), closely followed by acne (40.6%).[7] Another Saudi report by Guraya et al., showed a 36.1% prevalence of hirsutism and 31.4% of acne.[8] In Jordan, Abusailik et al. reported that acne was the most common manifestation (75.3%) followed by hirsutism (59.6%).[6]

Hirsutism affects approximately 65% to 75% of women diagnosed with PCOS, making it one of the most prevalent symptoms of this condition.[9] The presence of

hirsutism can lead to significant psychosocial distress. Many women experience feelings of embarrassment, anxiety, and depression due to their appearance, which can severely impact their self-esteem and social interactions.[10]

Acne in PCOS patients is often attributed to increased sebum production and altered keratinization due to hyperandrogenism. Studies indicate that a substantial proportion of women with acne may also have underlying PCOS, with estimates suggesting that 48% to 60% of acne patients meet the diagnostic criteria for PCOS.[11] It is noteworthy to highlight that in our study, acne patients with PCOS had lesions that were deeper and more inflammatory than those without PCOS, leading to longer healing times and a higher likelihood of scarring.

Acanthosis nigricans was noted in 58% of PCOS patients which is often associated with insulin resistance, a common feature in PCOS. Another Iraqi study by Sharqie et al. reported a (69%) prevalence.[12] Qaqish et al. and Yerram et al. reported lower rates at 31.5% and 34.2%, respectively.[13][14] Patients with PCOS who exhibit acanthosis nigricans are at an increased risk for developing type 2 diabetes and cardiovascular diseases due to the underlying insulin resistance. This underscores the importance of early detection and management of acanthosis nigricans as part of a broader strategy to mitigate long-term health risks associated with PCOS.[15]

Although the PCOS group did not exhibit a significantly higher rate of hidradenitis suppurativa, the p-value of 0.065 was close to statistical significance. This finding suggests that a larger sample size could potentially reveal a statistically significant association between PCOS and hidradenitis suppurativa. A comprehensive study involving 22,990 patients with hidradenitis suppurativa revealed a prevalence of polycystic ovary syndrome (PCOS) of 9.0% among those with hidradenitis suppurativa, in contrast to 2.9% in individuals without the condition with the difference being statistically significant. The likelihood of patients with hidradenitis suppurativa having PCOS was 2.14 times that of patients without HS. The strength of the HS association with PCOS was similar to that of diabetes mellitus and obesity.[16]

Androgenic alopecia had a prevalence of 38% among PCOS patients. In Turkey, Ozdemir et al. reported a prevalence of 35%.[17] Whereas Qaqish et al. reported a higher prevalence of 42.5%.[13]

A notable finding of our study is that chronic telogen effluvium was significantly higher in the PCOS group. This observation may be explained by the established link between PCOS and elevated stress levels, a known etiological factor in the development of telogen effluvium. Further studies are needed to establish the mechanism behind this association.

The presence of melasma was also shown to be higher among the PCOS group. This is in concordance with Khah et al. reported that ovarian cysts were present in 65.3% of melasma patients compared to 47.5% in controls, suggesting a potential link between ovarian abnormalities and melasma development.[18]

In our study, a statistically significant difference was observed in the prevalence of striae between the PCOS and control groups. The PCOS group exhibited a significantly higher rate of striae (65%) compared to the control group (35%). Qaqish et al. reported striae in 35.6%. Keen et al. reported a rate of 13%.[19]

CONCLUSION

Based on the findings of this study, Hirsutism, acne, acanthosis nigricans, chronic telogen effluvium, and androgenic alopecia were significantly more prevalent in PCOS patients compared to controls, highlighting the importance of dermatological signs in PCOS diagnosis. While hidradenitis suppurativa did not reach statistical significance, the borderline p-value suggests a potential association warranting further investigation. Early diagnosis and management of dermatological symptoms, alongside hormonal and metabolic considerations, are crucial for improving the quality of life for women with PCOS.

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