Research Letters

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Prevalence of skin diseases in women with endometriosis: a cross-sectional study

Keywords: alopecia areata, chronic urticaria, endometriosis, psoriasis, skin diseases

Dear Editor,

Endometriosis is a chronic estrogen-dependent disorder with a rising incidence in the last few decades among women of reproductive age. Despite its uncertain pathogenesis, immune and inflammatory dysfunctions have been proposed as critical factors for its development.[1]

Similar to endometriosis, certain dermatoses are influenced by inflammatory, immunological, and hormonal factors. However, there is limited research investigating these associations. In this study, our objective is to assess the frequency of skin conditions among women with endometriosis, in comparison to those without the condition.

A cross-sectional study was conducted by including 835 adults with endometriosis, recruited from Internet groups, and by nonrandom sampling at a gynecology outpatient clinic; 39 were interviewed in person. As a comparison group, we included 309 women selected among patients who consecutively attended the gynecology clinic due to other complaints, companions in consultations, and employees of the hospital. The protocol was approved by the institution's research ethics committee (#4,891,506), and informed consent of all participants was obtained.

The noninclusion criteria for the endometriosis group were >55 years and diagnostic not confirmed by a gynecologist. Women aged >55 years, with signs and/or symptoms of endometriosis, or who underwent regular follow-up at the institution's dermatology clinic, were not included in the comparison group.

The participants were asked about current dermatoses (self-reported on the Internet and confirmed by a dermatologist in the endometriosis subjects interviewed in person, and in the whole comparison group). The effect size of the associations was represented by the prevalence ratio and its 95% confidence interval, estimated by a generalized linear model (robust Poisson regression), adjusted for age, body composition, skin color, and education. Significance was set as $P < .05$.

The demographic data of the sample are presented in Table 1, and the clinical data of individuals with endometriosis are in Supplementary Table 1, http://links.lww.com/IJWD/A63.

Chronic urticaria (CU), alopecia areata (AA), and psoriasis were more prevalent in individuals with endometriosis (Table 2), compared with women without the disease. Among the endometriosis group, 71.7% reported some dermatosis: 55.8% confirmed by a dermatologist, 7.3% by a general practitioner, and 36.9% not established by a physician (self-diagnosis).

The sensitivity analysis, including only the 614 endometriosis subjects with dermatosis established by a physician (Supplementary Table 2, http://links.lww.com/IJWD/A64), and another with 408 endometriosis cases identified through surgery (Supplementary Table 3, http://links.lww.com/IJWD/A65), ratified the findings of the main study.

Increases in serum levels of some inflammatory cytokines have been described in patients with endometriosis (eg, IL-6, IL-17, TNFα), as well as in dermatoses, such as CU, AA, and psoriasis, which could explain an underlying pathophysiological pathway to such associations identified in our sample.[1]

A higher frequency of CU is identified among women, suggesting a role for estrogen in its pathogenesis.[2] In endometriosis, estrogen is a determinant for the development of lesions, and it can also influence humoral immunity.[1,3] CU may also be exacerbated by drugs used in endometriosis, such as analgesics, anti-inflammatories, and hormone therapies. Although the effect of hormonal therapy on CU is uncertain, there are cases of CU related to the perimenstrual period in a cyclical way, representing a hypersensitivity reaction called autoimmune progesterone dermatitis, for which a developmental

What is known about this subject in regard to women and their families?

- Endometriosis is a chronic estrogen-dependent disorder with unclear pathogenesis, although the immune system and inflammatory response are directly involved in its development.
- Despite the increasing population prevalence of endometriosis in modern times and its potential shared pathophysiological mechanisms with some dermatoses associated with immunological, inflammatory, and hormonal factors, to date, no study has investigated the co-occurrence of endometriosis and inflammatory dermatoses.

What is new from this article as messages for women and their families?

- Chronic urticaria, alopecia areata, and psoriasis are more prevalent in women with endometriosis than in women without the disease.
- The co-occurrence of endometriosis and these inflammatory skin diseases highlights the importance of recognizing associated comorbidities and providing comprehensive care for the overall health of these patients.

International Journal of Women's Dermatology (2025) 11:e195

Received: 3 June 2024; Accepted 3 January 2025

Published online 3 February 2025

DOI: 10.1097/JW9.0000000000000195

Table 1

Demographic data from 835 adults with endometriosis and 309 women without the disease

Variables	Endometriosis	Women without endometriosis	*P* value
Age, years, *n* (%)			.326
18–30 years	218 (26.1%)	106 (34.3%)	
31–40 years	397 (47.5%)	112 (36.2%)	
41–55 years	220 (26.5%)	91 (29.4%)	
Self-declared color, *n* (%)			.165
White	498 (59.6%)	186 (60.2%)	
Brown	258 (30.9%)	93 (30.1%)	
Black	64 (7.7%)	18 (5.8%)	
Yellow (Amerindian and Asian)	15 (1.8%)	12 (3.9%)	
Education, *n* (%)			**.002**
Did not study/elementary school	25 (3.0%)	25 (8.1%)	
Entered high school	210 (25.1%)	83 (26.9%)	
Entered higher education	600 (71.9%)	201 (65.0%)	
Body composition, *n* (%)			.363
Underweight (slim)	53 (6.3%)	16 (5.2%)	
Within weight (normal)	363 (43.5%)	173 (56.0%)	
Overweight (heavy)	362 (43.4%)	74 (23.9%)	
Very overweight (obese)	57 (6.8%)	46 (14.9%)	

Boldface indicates $P < .05$.

mechanism related to prior exposure to exogenous progesterone is hypothesized.[4]

Other studies have suggested an association between endometriosis with AA, psoriasis with psoriatic arthritis, lupus erythematosus, allergic diseases, and nondermatological conditions such as cardiovascular diseases.[5–8]

This research has limitations related to information bias regarding self-reported skin diseases on the Internet and the lack of exploration of less prevalent dermatoses in the population.

Further studies should explore the timeline of onset between endometriosis and these inflammatory dermatoses, as well as the impact of coexisting conditions on treatment outcomes and how disease severity affects concurrent disorders. Additionally, it is important to investigate the systemic effects of cytokines on these patients, assessing their potential as biomarkers for diagnosis, disease severity, and therapeutic targets. Finally, research should examine the influence of hormonal disturbances associated with endometriosis on the pathogenesis of these dermatoses.

In conclusion, CU, AA, and psoriasis are more prevalent in people with endometriosis than in women without the disease. The high prevalence of these conditions highlights the importance of recognizing associated comorbidities and providing comprehensive care for the overall health of these patients.

Conflicts of interest

The authors made the following disclosures: C.C.S.C.: Advisory Board – Janssen, Aché, Novartis, Sun-Pharma, Pfizer, and Knight Therapeutics; Speaker – Janssen, Aché, Sanofi, Novartis, and Abbvie; Clinical trial – Janssen, Aché, Sanofi, and Abbvie. The other authors have no conflicts of interest.

Funding

None.

Study approval

This study protocol was reviewed and approved by the Institution's Research Ethics committee on August 7, 2021 (#4,891,506) – Universidade Estadual do Oeste do Paraná. The study was performed following the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Author contributions

PHS, CCSC, HZM, HAM: Participated in study conception and design, and analysis and interpretation of data. PHS, CCSC, HZM, CGG, FSL, HAM: Participated in acquisition of data and critical review of the manuscript. PHS, HAM: Participated in statistical analysis and drafting of the manuscript. All authors read and approved the final manuscript.

Patient consent

Informed consent forms were acquired from all participants.

Acknowledgments

The authors would like to thank the participants who provided consent to participate in the study and publish their results. The authors would also like to thank the team of the Gynecology

Table 2

Prevalence of skin diseases in 835 adults with endometriosis and 309 women without the disease

Variables	Endometriosis	Women without endometriosis	PR[a]	*P* value[a]
Skin diseases				
Acne	422 (50.5%)	146 (47.2%)	1.1 (0.9–1.2)	.337
Alopecia areata	39 (4.7%)	3 (1.0%)	4.6 (1.4–15.2)	**.012**
Atopic dermatitis	93 (11.1%)	22 (7.1%)	1.5 (1.0–2.3)	.079
Hidradenitis suppurativa	4 (0.5%)	1 (0.3%)	1.6 (0.2–13.4)	.662
Lichen planus	7 (0.8%)	1 (0.3%)	1.8 (0.2–17.1)	.589
Lupus erythematosus	4 (0.5%)	0 (-)	3.3 (0.1–27.7)	.141
Melasma	167 (20.0%)	72 (23.3%)	0.9 (0.7–1.1)	.295
Psoriasis	27 (3.2%)	2 (0.6%)	4.8 (1.2–19.5)	**.029**
Rosacea	45 (5.4%)	14 (4.5%)	1.1 (0.6–1.9)	.838
Chronic urticaria[b]	44 (5.3%)	2 (0.6%)	7.5 (1.8–31.1)	**.006**
Vitiligo	7 (0.8%)	3 (1%)	0.8 (0.2–3.5)	.816

Boldface indicates $P < .05$. PR, prevalence ratio.

[a]Values adjusted for age, education, body composition, and color.

[b]Urticaria for more than 6 weeks.

Service at Universidade Estadual do Oeste do Paraná who contributed to the patient-selection process.

Supplementary data

Supplementary material associated with this article can be found at http://links.lww.com/IJWD/A63, http://links.lww.com/IJWD/A64, and http://links.lww.com/IJWD/A65.

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