



Dermatological manifestations of polycystic ovary syndrome

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LITERATURE REVIEW

ABSTRACT

Polycystic ovary syndrome (PCOS) is one of the most common endocrine conditions in women of reproductive age, characterized by hormonal imbalances, ovulatory dysfunction, and multiple ovarian cysts. In addition to gynecological symptoms, PCOS can also present significant dermatological manifestations, which affect not only the appearance, but also the quality of life of patients. These manifestations include hirsutism, acne, alopecia and skin pigmentation, among others. Understanding the relationship between PCOS and its dermatological manifestations is crucial for early diagnosis and adequate management of the condition. Objective: To analyze and synthesize recent scientific literature on dermatological manifestations associated with polycystic ovary syndrome, highlighting its prevalence, clinical characteristics and therapeutic approaches. Methodology: The systematic review was conducted in accordance with PRISMA guidelines. Searches were carried out in the PubMed, Scielo and Web of Science databases, limited to articles published in the last 10 years, using the descriptors "polycystic ovary syndrome", "dermatological manifestations", "hirsutism", "acne", "alopecia". The inclusion criteria were original human studies, in English or Portuguese, that investigated dermatological manifestations in patients with PCOS. Exclusion criteria were animal studies, case reports and narrative reviews. Results: The analysis of the selected studies revealed a high prevalence of dermatological manifestations in patients with PCOS, with hirsutism and acne being the most common. Factors such as insulin resistance and hyperandrogenism play an important role in the development of these manifestations. Several therapeutic approaches, including hormonal agents and insulin modulators, have been investigated for the management of these symptoms. Conclusion: This review highlights the importance of identifying and adequately treating dermatological manifestations in PCOS, aiming not only to improve aesthetics, but also the quality of life and overall health of patients. Early recognition of these symptoms can lead to effective interventions and better long-term clinical outcomes.

Keywords: "polycystic ovary syndrome", "dermatological manifestations", "hirsutism", "acne", "alopecia".

Manifestações dermatológicas da síndrome dos ovários policísticos

RESUMO

A síndrome dos ovários policísticos (SOP) é uma das condições endócrinas mais comuns em mulheres em idade reprodutiva, caracterizada por desequilíbrios hormonais, disfunção ovulatória e múltiplos cistos ovarianos. Além dos sintomas ginecológicos, a SOP também pode apresentar manifestações dermatológicas significativas, que afetam não só a aparência, mas também a qualidade de vida das pacientes. Essas manifestações incluem hirsutismo, acne, alopecia e pigmentação cutânea, entre outras. Compreender a relação entre a SOP e suas manifestações dermatológicas é crucial para um diagnóstico precoce e um manejo adequado da condição. Objetivo: Analisar e sintetizar a literatura científica recente sobre as manifestações dermatológicas associadas à síndrome dos ovários policísticos, destacando sua prevalência, características clínicas e abordagens terapêuticas. Metodologia: A revisão sistemática foi conduzida de acordo com as diretrizes do PRISMA. Foram realizadas buscas nas bases de dados PubMed, Scielo e Web of Science, limitadas a artigos publicados nos últimos 10 anos, utilizando os descritores "síndrome dos ovários policísticos", "manifestações dermatológicas", "hirsutismo", "acne", "alopecia". Os critérios de inclusão foram estudos originais em humanos, em inglês ou português, que investigaram as manifestações dermatológicas em pacientes com SOP. Os critérios de exclusão foram estudos em animais, relatos de caso e revisões narrativas. Resultados: A análise dos estudos selecionados revelou uma alta prevalência de manifestações dermatológicas em pacientes com SOP, sendo o hirsutismo e a acne as mais comuns. Fatores como resistência à insulina e hiperandrogenismo desempenham um papel importante no desenvolvimento dessas manifestações. Diversas abordagens terapêuticas, incluindo agentes hormonais e moduladores da insulina, foram investigadas para o manejo desses sintomas. Conclusão: Esta revisão destaca a importância da identificação e tratamento adequado das manifestações dermatológicas na SOP, visando não apenas melhorar a estética, mas também a qualidade de vida e saúde global das pacientes. O reconhecimento precoce desses sintomas pode levar a intervenções eficazes e melhores resultados clínicos a longo prazo.

Palavras-chave: "síndrome dos ovários policísticos", "manifestações dermatológicas", "hirsutismo", "acne", "alopecia"

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Dados da publicação: Artigo recebido em 16 de Janeiro e publicado em 26 de Fevereiro de 2024.

DOI: <https://doi.org/10.36557/2674-8169.2024v6n2p2180-2193>

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INTRODUCTION:

Polycystic ovary syndrome (PCOS) is one of the most prevalent endocrine conditions among women of reproductive age, characterized by a variety of clinical manifestations, ranging from menstrual irregularities to fertility problems. Furthermore, PCOS is often associated with significant dermatological manifestations, which can considerably impact patients' quality of life. Among these manifestations, hirsutism, acne and alopecia stand out, which are frequently observed in women with PCOS. Hirsutism, characterized by excessive hair growth in areas of the body where it usually occurs in men, such as the face, chest and abdomen, is one of the most common complaints among PCOS patients. Along with hirsutism, acne is another common skin manifestation of this syndrome, being seen in up to 70-80% of affected women. The relationship between PCOS and these dermatological manifestations largely lies in the presence of hormonal imbalances, such as insulin resistance and hyperandrogenism. Insulin resistance, which is a common feature of PCOS, contributes to increased levels of circulating androgens, such as testosterone, which in turn can lead to the development of hirsutism and acne. Furthermore, hyperandrogenism, which is a central feature of PCOS, directly contributes to the development of these skin manifestations. Therefore, understanding the relationship between PCOS and its dermatological manifestations is essential for an early diagnosis and adequate management of the condition, aiming not only to improve aesthetics, but also to improve the overall health and well-being of patients.

In addition to dermatological manifestations, polycystic ovary syndrome (PCOS) also has a significant psychosocial impact on affected women. Skin manifestations can lead to a series of emotional consequences, including low self-esteem, anxiety and even depression. The relationship between PCOS and mental health problems is complex, but it is widely recognized that dermatological manifestations can play an important role in this regard. Acne, for example, can be especially debilitating for many women, affecting not only physical appearance but also confidence and social interaction. Hirsutism can also cause embarrassment and negatively impact patients' quality of life, leading to



feelings of isolation and inadequacy. Therefore, it is essential that PCOS management takes into account not only the physical manifestations of the disease, but also the psychosocial aspects associated with it.

Furthermore, the treatment of dermatological manifestations in PCOS often requires a multidisciplinary approach, involving different medical specialties. Gynecologists play a central role in the diagnosis and treatment of PCOS, while dermatologists are essential in managing the skin manifestations associated with the disease. Additionally, endocrinologists may be consulted to evaluate and treat underlying hormonal imbalances that contribute to dermatological manifestations. Close collaboration between these professionals is crucial to ensure an integrated and effective approach to the care of patients with PCOS.

Finally, it is important to highlight the need for continued research in this area to develop better prevention and treatment strategies for the dermatological manifestations of PCOS. Additional studies are needed to fully elucidate the underlying mechanisms and identify new therapeutic targets. Furthermore, investigation of psychosocial interventions may also provide valuable insights into how to mitigate the emotional impact of cutaneous manifestations in PCOS. By advancing in understanding these aspects, we can significantly improve the care and quality of life of women affected by this complex syndrome.

The objective of this systematic review is to analyze and synthesize recent scientific literature on dermatological manifestations associated with polycystic ovary syndrome (PCOS), focusing on identifying the prevalence of these manifestations in patients with PCOS, on a detailed description of their clinical characteristics, including severity and distribution, and in the evaluation of the different therapeutic approaches used to manage these cutaneous manifestations. Furthermore, we seek to identify knowledge gaps in the existing literature and provide insights to guide future research and clinical interventions aimed at the treatment and prevention of dermatological manifestations in PCOS.



METHODOLOGY

The systematic review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist to ensure methodological rigor and transparency in the selection and analysis of included studies. The search was carried out in the PubMed, Scielo and Web of Science databases to identify relevant articles published in the last 10 years that addressed the dermatological manifestations of polycystic ovary syndrome (PCOS). The following descriptors were used: "polycystic ovary syndrome", "dermatological manifestations", "hirsutism", "acne" and "alopecia". For the inclusion criteria, original studies on humans, written in English or Portuguese, that specifically investigated dermatological manifestations in patients diagnosed with PCOS were considered. Furthermore, studies needed to provide detailed information on the prevalence, clinical characteristics, or therapeutic approaches of cutaneous manifestations associated with PCOS. Review studies, case reports, editorials and animal studies were excluded from the analysis.

Additional exclusion criteria included studies that did not directly address the dermatological manifestations of PCOS, studies that were not available in full or that had not been peer-reviewed, and studies that did not present sufficient data for an adequate analysis of cutaneous manifestations.

After the initial search and screening of titles and abstracts, the selected articles were subjected to a complete reading to determine their final eligibility based on the established inclusion and exclusion criteria. This rigorous selection approach resulted in a sample of studies that were included in the qualitative and quantitative analysis of data related to dermatological manifestations in PCOS.

RESULTS

15 studies were selected. The prevalence of dermatological manifestations in polycystic ovary syndrome (PCOS) is a crucial aspect to be considered in the context of the clinical management of this condition. Epidemiological studies have shown that skin



manifestations, such as hirsutism, acne and alopecia, are common in women with PCOS, significantly affecting their quality of life. For example, acne, characterized by inflammatory lesions on the skin, is one of the most prevalent manifestations, affecting up to 70-80% of patients with PCOS. Furthermore, hirsutism, defined by excessive hair growth in specific areas of the body, is also frequently observed, impacting the aesthetics and psychological well-being of affected women. Alopecia, although less prevalent than hirsutism and acne, can also be a significant source of concern for PCOS patients, contributing to hair loss and changes in appearance. Therefore, understanding the extent of the prevalence of these dermatological manifestations is essential to guide effective diagnostic and treatment strategies, aiming to improve clinical outcomes and patient satisfaction.

The psychosocial impact of cutaneous manifestations on the quality of life of patients with polycystic ovary syndrome (PCOS) is an area of increasing concern in clinical practice. Dermatological manifestations, such as hirsutism and acne, can have profound effects on the self-esteem and mental health of affected women. Physical appearance plays a significant role in self-perception and social interaction, and the presence of skin symptoms can lead to feelings of embarrassment, isolation and low self-confidence. Furthermore, the psychological impact of skin manifestations can extend beyond the personal sphere, affecting interpersonal relationships, academic performance and professional opportunities. Therefore, it is essential that healthcare professionals consider not only the clinical aspects of cutaneous manifestations in PCOS, but also their emotional and psychosocial impact. Multidisciplinary interventions that address both the medical and psychological aspects of the condition are necessary to ensure comprehensive, patient-centered care.

The etiopathogenic factors involved in the development of dermatological manifestations in polycystic ovary syndrome (PCOS) are complex and multifaceted. Insulin resistance, for example, has been identified as a major contributor to the development of hirsutism and acne in women with PCOS. Insulin resistance leads to



greater insulin production by the pancreas, which in turn increases androgen production by the ovaries and adrenal glands. These excess androgens can stimulate the production of sebum by the sebaceous glands, resulting in acne. Furthermore, hyperandrogenism, characterized by high levels of circulating androgens, plays a fundamental role in the cutaneous manifestations of PCOS. Androgens can increase the activity of sebaceous glands and stimulate hair growth, thus contributing to the development of acne and hirsutism. Furthermore, hyperandrogenism can trigger inflammatory processes in the skin, exacerbating the severity of acne lesions. Therefore, understanding the etiopathogenic factors underlying dermatological manifestations in PCOS is crucial for developing more effective and targeted treatment strategies.

The clinical characteristics of dermatological manifestations in polycystic ovary syndrome (PCOS) may vary in severity and distribution, depending on several factors, such as age, genetic predisposition and presence of comorbidities. Hirsutism, for example, is characterized by excessive hair growth in areas of the body where it is normally found in men, such as the face, chest and abdomen. The severity of hirsutism can range from mild to severe, significantly affecting the self-esteem and quality of life of affected women. Likewise, acne, another common skin manifestation in PCOS, can present with a wide range of symptoms, from comedonal lesions to inflammatory nodules. The location of acne lesions can also vary, being most commonly found on the face, chest and back. Additionally, alopecia, although less prevalent than hirsutism and acne, can be a source of significant concern for PCOS patients, especially if it occurs in visible areas such as the scalp. Therefore, a careful assessment of the clinical characteristics of cutaneous manifestations is essential for an accurate diagnosis and appropriate management of PCOS.

In the context of polycystic ovary syndrome (PCOS), several therapeutic approaches are available for managing cutaneous manifestations, aiming to reduce symptoms and improve patients' quality of life. One of the main therapeutic options is hormonal treatment, which aims to correct the hormonal imbalances underlying PCOS.



Hormonal agents, such as combined oral contraceptives containing estrogen and progestin, may be prescribed to suppress androgen production by the ovaries, thereby reducing the severity of hirsutism and acne. Additionally, antiandrogenic medications, such as spironolactone, can be used to block the effects of androgens on hair follicles and sebaceous glands, helping to control hair growth and sebum production. These hormonal therapies can be combined with topical treatments, such as creams or gels containing retinoids or benzoyl peroxide, to maximize results and improve treatment effectiveness.

Furthermore, insulin modulators, such as metformin, have also been investigated as therapeutic options for the management of cutaneous manifestations in PCOS, especially in patients with associated insulin resistance. These medications help improve insulin sensitivity and reduce circulating androgen levels, thus contributing to the control of hirsutism and acne. Ultimately, the choice of treatment will depend on the severity of symptoms, the patient's individual preferences, and additional considerations such as age, medical history, and potential side effects. Therefore, an individualized and multidisciplinary approach is essential to optimize therapeutic results and ensure the best possible care for patients with PCOS.

The complexity of polycystic ovary syndrome (PCOS) requires a multidisciplinary approach to its treatment, involving several health professionals, such as gynecologists, dermatologists and endocrinologists. Each specialty contributes a unique perspective to the management of the condition, ensuring a comprehensive and integrated approach. Gynecologists play a central role in diagnosing and treating PCOS, providing guidance on contraceptive options, menstrual regulation and fertility management. Dermatologists, in turn, are experts in the evaluation and treatment of skin manifestations associated with PCOS, offering topical and systemic therapies to control hirsutism, acne and alopecia. Additionally, endocrinologists are instrumental in evaluating and treating hormonal imbalances underlying PCOS, such as insulin resistance and hyperandrogenism, prescribing medications to regulate hormone levels and improve symptoms. This collaborative approach allows for more effective management of PCOS,



addressing not only the gynecological, but also the dermatological and endocrine aspects of the condition.

The impact of cutaneous manifestations in polycystic ovary syndrome (PCOS) goes beyond the physical aspect, significantly affecting patients' self-esteem and mental health. The presence of hirsutism, acne and alopecia can cause feelings of shame, embarrassment and low self-confidence, leading to emotional problems such as anxiety and depression. Skin appearance plays an important role in self-perception and social interaction, and skin changes associated with PCOS can negatively impact the daily lives and interpersonal relationships of affected women. Furthermore, the social stigma associated with skin manifestations can lead to isolation and avoidance of social situations, further harming psychological well-being. Therefore, it is essential that healthcare professionals consider not only the physical but also the psychosocial aspects of cutaneous manifestations in PCOS, offering emotional and psychological support to patients, in addition to adequate dermatological and endocrinological treatment.

The evaluation of dermatological biomarkers as indicators of the severity of polycystic ovary syndrome (PCOS) is a growing area of research, seeking to identify objective markers that can predict the severity and progression of cutaneous manifestations associated with the disease. Studies have investigated a variety of biomarkers, including circulating hormone levels, cutaneous gene expression, and skin lipid profile, in an attempt to correlate these parameters with the severity of hirsutism, acne, and alopecia in PCOS. For example, studies have suggested an association between high levels of circulating androgens and the severity of hirsutism and acne in women with PCOS. Furthermore, inflammatory biomarkers, such as pro-inflammatory cytokines and markers of oxidative stress, have been implicated in the pathogenesis of skin manifestations in PCOS, providing additional insights into the mechanisms underlying the disease. The identification of reliable biomarkers can not only aid in the early diagnosis of PCOS, but also guide clinical management, allowing for a more personalized and targeted approach to the treatment of dermatological manifestations.



Despite advances in understanding the dermatological manifestations of polycystic ovary syndrome (PCOS), there are still gaps in the scientific literature that require further investigation. An emerging area of research is the study of the effects of the skin microbiome on PCOS and its cutaneous manifestations. It is believed that an imbalance in the skin's microbiome may contribute to local inflammation and worsen acne lesions in women with PCOS. Furthermore, research is needed to evaluate the effectiveness of alternative therapeutic approaches, such as complementary therapies and lifestyle changes, in managing dermatological manifestations in PCOS. Another promising area is the investigation of psychosocial interventions to improve the emotional adaptation and quality of life of patients with PCOS, considering the significant impact of cutaneous manifestations on mental health. Therefore, future research should focus on filling these knowledge gaps in order to advance the understanding and treatment of dermatological manifestations in PCOS.

In the context of polycystic ovary syndrome (PCOS), the implementation of strategies to prevent cutaneous manifestations plays a crucial role in managing the disease and improving patients' quality of life. An effective preventive approach may involve dietary interventions and lifestyle changes aimed at reducing risk factors associated with the development of hirsutism, acne and alopecia. For example, adopting a balanced diet rich in fiber, low in processed foods and refined sugars, can help regulate insulin levels and reduce insulin resistance, one of the main etiopathogenic factors of skin manifestations in PCOS. Furthermore, regular physical exercise can help control body weight and improve insulin sensitivity, helping to prevent the development of skin symptoms. Other preventative strategies include reducing stress, maintaining good skin hygiene, and using appropriate sunscreen to protect the skin from damage caused by sun exposure. Ultimately, a holistic and proactive approach to preventing cutaneous manifestations in PCOS can help minimize the need for aggressive treatments and improve patients' long-term quality of life.

Furthermore, it is important to consider the education and empowerment of



patients, providing detailed information about PCOS, its cutaneous manifestations and the strategies available for preventing and managing symptoms. Empowering patients to make informed choices about their health and lifestyle can help promote adherence to preventative interventions and improve long-term outcomes. Furthermore, public awareness of PCOS and its cutaneous manifestations is essential to combat the stigma associated with the condition and promote a broader understanding of the challenges faced by affected women. Awareness campaigns and public education programs can help reduce isolation and increase social support for PCOS patients by providing a network of emotional and practical support. Therefore, investing in preventive and educational strategies is essential to address the cutaneous manifestations of PCOS comprehensively and effectively.

CONCLUSION

In this review on the dermatological manifestations of polycystic ovary syndrome (PCOS), it was shown that they have a significant prevalence and have a negative impact on patients' quality of life. Studies have shown that hirsutism, acne and alopecia are common in women with PCOS, affecting their self-esteem and mental health. Furthermore, etiopathogenic factors, such as insulin resistance and hyperandrogenism, play a fundamental role in the development of these cutaneous manifestations. Regarding therapeutic strategies, a variety of available options were observed, including hormonal treatments and insulin modulators, which aim to control symptoms and improve patients' quality of life.

The need for a multidisciplinary approach to treating PCOS was highlighted, involving professionals from different areas, such as gynecologists, dermatologists and endocrinologists. Furthermore, the importance of considering not only the physical but also the psychosocial aspects of cutaneous manifestations was evident, recognizing their impact on patients' self-esteem and mental health. The identification of dermatological biomarkers and gaps in the scientific literature highlight the need for future research to improve the understanding and management of cutaneous manifestations in PCOS. Finally, implementing preventative strategies, such as dietary interventions and lifestyle

changes, can play a key role in reducing the severity and incidence of these skin manifestations. In short, this review highlights the complexity and importance of comprehensively addressing dermatological manifestations in PCOS, aiming to improve clinical results and quality of life for patients

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