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COMPREHENSIVE MANAGEMENT OF ACNE VULGARIS: AN UPDATE ON THERAPEUTIC APPROACHES

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ABSTRACT Acne vulgaris is a widespread skin condition affecting up to 90% of adolescents, with 50% of cases persisting into adulthood. By age 40, around 1% of men and 5% of women still exhibit symptoms. This high prevalence results in over 3.5 million healthcare visits annually. The multifactorial pathogenesis of acne includes hormonal fluctuations, increased sebum production, keratinization alterations, and Propionibacterium acnes proliferation. Key risk factors include hormonal changes, genetic predisposition, diet, stress, and skin care practices. Clinically, acne manifests as non-inflammatory lesions (comedones) and inflammatory lesions (papules, pustules, nodules). Diagnosis involves a thorough clinical evaluation, with severity guiding treatment. Management ranges from topical treatments for mild acne to systemic therapies for severe cases. Managing complications such as post-inflammatory hyperpigmentation and scarring is crucial, utilizing topical agents, chemical peels, and laser treatments.

KEYWORDS : Acne vulgaris, Sebum production, Propionibacterium acnes, Comedones.

INTRODUCTION

Acne vulgaris, a prevalent dermatological condition, significantly impacts patients' quality of life across various ages, predominantly affecting adolescents and young adults. Characterized by its multifactorial pathogenesis involving sebum production, follicular hyperkeratinization, microbial colonization, and inflammation, acne presents a therapeutic challenge necessitating multifaceted treatment strategies. Recent advances emphasize a tailored approach, integrating both established and novel therapies to manage the spectrum of acne severity. This narrative review updates the current understanding of acne vulgaris management, highlighting the evolution of treatment modalities (1).

METHODS

The methodology for this narrative review involved a comprehensive literature search across four major databases: PubMed, Scopus, Web of Science, and Google Scholar. The search aimed to gather recent and relevant studies on the management of acne vulgaris, employing keywords such as "acne vulgaris," "treatment," "therapeutic approaches," "pathophysiology," and "clinical management." The initial search yielded a broad set of articles, from which duplicates were removed, and titles and abstracts were scrutinized for relevance. Following this, full-text articles were assessed based on predefined inclusion criteria focusing on the novelty of treatment methods, clinical trials, and reviews published within the last decade. Ultimately, 15 references were carefully selected for this review, ensuring a focus on high-quality studies that provide insights into the evolving landscape of acne management strategies.

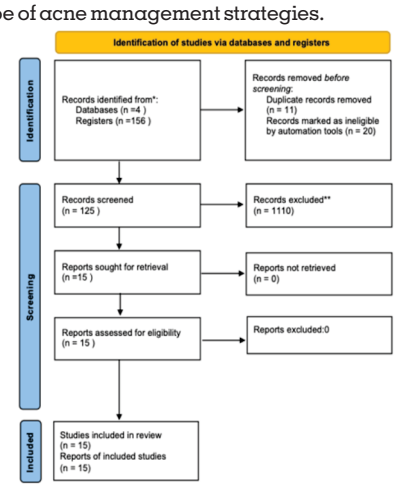

Figure 1. PRISMA.

Epidemiology

Acne vulgaris remains a prevalent skin condition affecting up to 90% of adolescents and persisting into adulthood in around 50% of cases. The disease's presence varies with age; by 40 years, about 1% of men and 5% of women continue to show symptoms. The high incidence of acne prompts significant numbers of healthcare visits, with over 3.5 million annual visits reported in the UK alone. The increase in prevalence among children may be linked to earlier pubertal onset, suggesting a shifting demographic in affected populations (1,2).

Pathogenesis

The pathogenesis of acne vulgaris is multifactorial, influenced significantly by hormonal fluctuations that increase sebum production, alterations in keratinization leading to clogged pores, and the proliferation of Propionibacterium acnes (P. acnes) within the skin. Hormonal changes, especially increases in androgens, stimulate sebaceous glands to produce more sebum, while abnormal shedding of skin cells leads to comedone formation. The immune response to P. acnes can cause inflammation, further exacerbating acne symptoms. Additionally, recent studies suggest a role for diet and genetics in the development and severity of acne (3).

Risk Factor

Acne vulgaris, commonly affecting adolescents and young adults, is influenced by multiple risk factors, making its management complex. Hormonal fluctuations play a significant role, as androgens increase sebum production and skin cell proliferation, creating a prime environment for acne development. Genetic predisposition is also notable, with a higher likelihood of acne in individuals with a family history of the condition (4).

Environmental and lifestyle factors contribute significantly. Diet, particularly high-glycemic foods and dairy, may exacerbate acne, though the relationship remains complex and somewhat inconsistent across studies. Stress and certain medications can also worsen acne by influencing hormonal levels and skin inflammation (5).

Interestingly, skin care practices and the local skin environment (such as the presence of Cutibacterium acnes and skin trauma) are crucial in acne's pathology. These bacteria thrive in oily environments, worsening the inflammation associated with acne. Understanding these risk factors is essential for targeted prevention and treatment strategies, aiming to mitigate these influences and improve skin health (6).

Clinical Manifestations

Acne vulgaris manifests predominantly in areas rich in sebaceous glands, such as the face, neck, chest, upper back, and upper arms. The clinical presentation of acne can vary significantly, ranging from non-inflammatory lesions, which include closed comedones (whiteheads) and open comedones (blackheads), to inflammatory forms that present as red papules, pustules, and severe nodules and cysts. These inflammatory lesions are more likely to lead to scarring and psychological distress, affecting the individual's quality of life and social interactions (7).

Adolescence is the peak period for acne due to hormonal changes that stimulate sebaceous gland activity. However, adult acne is also prevalent, especially among women, and is often associated with hormonal fluctuations related to menstrual cycles, pregnancy, or endocrine disorders. The persistent or late-onset acne in adults can be particularly challenging to manage and may respond differently to treatments compared to adolescent acne (8).

In clinical settings, acne is assessed for its severity, from mild to severe, based on the quantity and type of lesions. This classification helps in guiding treatment decisions. For instance, mild acne may be managed with topical treatments, whereas moderate to severe acne might require systemic treatments. The impact of acne is not just physical; studies suggest it also leads to significant psychological impacts, such as decreased self-esteem, anxiety, and even depression (9)

Diagnosis

The diagnosis of acne vulgaris involves a thorough clinical evaluation, which begins with a detailed history and physical examination. Acne is primarily diagnosed based on the presence and types of skin lesions, which include comedones, papules, pustules, nodules, and cysts. The distribution and severity of these lesions also play crucial roles in diagnosis and subsequent treatment planning (9,10).

Dermatologists typically categorize acne into several grades, ranging from mild to severe, based on lesion type and quantity. For example, mild acne might consist primarily of a few comedones and minor pustules, while severe acne would include numerous cysts and nodules, potentially with signs of scarring or inflammation (10).

Advanced diagnostic tools are seldom required but may include hormonal testing when an endocrine disorder is suspected, particularly if acne is resistant to standard therapies or presents in atypical ways, such as sudden onset in adulthood. Skin swabs and cultures are not routinely performed unless there is a concern for gram-negative folliculitis or other infections. Recent guidelines emphasize the need for a systematic approach to treatment based on acne severity and patient characteristics, to optimize outcomes and minimize complications like scarring (10,11).

Treatment

In treating acne vulgaris, it is essential to adopt a stratified approach based on the condition's severity. For mild acne, treatment options include benzoyl peroxide, available in formulations ranging from 2.5% to 10%, applied once or twice a day depending on patient tolerance. Lower concentrations are generally effective and less irritating. Alternatively, topical retinoids such as adapalene 0.1% or tretinoin ranging from 0.025% to 0.1%, are applied once daily at night to minimize direct sun exposure. Additionally, azelaic acid at concentrations of 15% to 20% can be used twice daily, effective for both inflammation and post-inflammatory hyper-pigmentation (11,12).

For moderate acne, combining topical treatments with oral antibiotics proves effective. Topical clindamycin at 1% can be applied twice daily. In the oral domain, doxycycline starts at a dose of 100 mg twice daily, reducing to 100 mg once daily depending on the patient's response. Minocycline begins at 100 mg per day, adjustable based on severity and patient response. It's advisable to combine topical retinoids in the evening with topical antibiotics and benzoyl peroxide in the morning to maximize efficacy and minimize antibiotic resistance (12,13).

In cases of severe acne, oral isotretinoin is typically prescribed at an initial dose of 0.5 mg/kg body weight per day, adjustable up to 1 mg/kg depending on tolerance and clinical response. The treatment duration usually ranges from 15 to 20 weeks. Alternatives like hormonal therapy with combined oral contraceptives, typically including ethinylestradiol (20 to 35 mcg) and a progestin, or spironolactone, starting at 25 mg twice a day and adjustable up to 100 mg twice a day, are useful especially in women with signs of hyperandrogenism (13).

Procedural therapies such as chemical peels and laser therapies also form part of acne management, with the frequency and type of treatment varying based on clinical assessment and patient needs. It is vital that all these treatments are supervised by a healthcare professional, with dosage adjustments and careful monitoring of adverse effects to optimize outcomes and minimize associated risks (13,14).

Management of Complications

Managing complications of acne vulgaris primarily involves addressing post-inflammatory hyperpigmentation (PIH) and acne scars. For PIH, topical treatments such as hydroquinone (2-4%), azelaic acid (15-20%), and topical retinoids are effective. These agents help to reduce melanin production and promote skin cell turnover. For scarring, options include chemical peels, dermabrasion, and laser treatments, which help to resurface the skin and improve texture. In severe cases, fillers or surgical interventions may be required. It's crucial to integrate sun protection strategies, as UV exposure can worsen PIH and prolong the healing process of scars (15).

In conclusion, successful management of acne vulgaris requires a comprehensive approach tailored to the severity and type of acne. Early and appropriate treatment is crucial to minimize the risk of permanent scarring and psychological distress.

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