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Selection of Acne Treatment Methods Taking into Account Pathogenetic Features

Sharopova Gulnoza Samadovna

Assistant of the Department of Dermatovenereology and Pediatric Dermatovenereology, Bukhara State Medical Institute

Annotation: Acne vulgaris is an inflammatory disease of the pilosebaceous ganglion that is chronic and self-limiting. Acne vulgaris is caused by Proionobacterium acnes during adolescence under the influence of normally circulating dehydroepiandrosterone. It is a very common skin disease that can present with inflammatory and non-inflammatory lesions. This event examines the etiology, evaluation and treatment of acne vulgaris and highlights the role of an interprofessional team in the care of patients with this condition.

Keywords: acne vulgaris, Proionobacterium acnes, acne classification, acne treatment, psychological effects of acne.

Relevance.

Acne is one of the most common skin conditions, affecting over 85% of adolescents. It usually begins during puberty and slowly resolves as a person reaches their 20s, although some people continue to have acne into their 40s and 50s. It is rarely life-threatening and is often ignored as a self-limiting condition. It receives little attention in undergraduate or postgraduate education. Although obviously cosmetic in nature, its impact can extend much deeper than the surface of the skin and can take a toll on patients emotionally and psychologically that can be far worse than the physical impact. Changes in skin appearance can lead to changes in body image, which in turn have been known to lead to anger, fear, shame, anxiety, depression, embarrassment, as well as bullying and stigmatization within peer groups. Lack of self-confidence, social isolation, feelings of insecurity and inferiority, limited employment opportunities, functional and interpersonal difficulties at work and suicidal tendencies have also been reported and associated with acne sequelae. The reduction in quality of life has been rated as significant, similar to epilepsy, asthma, diabetes or arthritis.

Etiopathogenesis

Acne is a multifactorial disease: genetic factors, stress, androgens, and excessive sweating all influence its development and/or severity. Corticosteroids, oral contraceptives, iodides, bromides, lithium, and chemicals such as dioxins are known to cause acne, as are endocrine disorders such as Cushing's syndrome and polycystic ovary syndrome. Current smokers are often found to have worse acne, but despite popular myth, diet, lack of exercise, poor hygiene, greasy hair, and hair hanging down onto the face have no effect.

Acne is a disorder of the sebaceous glands of the scalp. Altered keratinization patterns in the hair follicle block sebum secretion. Androgen hyperresponsiveness to sebocyte and follicular keratinocyte stimulation probably results in sebaceous gland hyperplasia and seborrhea, characteristic of acne. Enlarged follicular lumen, associated with accumulation of keratin and lipid debris, forms a closed comedo (whitehead). When the follicle has an entrance gate on the skin, the semisolid mass bulges out, forming a plug, forming an open comedo (blackhead).

Propionobacterium acnes colonizes the follicular duct and proliferates, breaking down sebum into triglycerides, irritants that likely contribute to inflammation. When the follicular epithelium is invaded by lymphocytes, it ruptures, releasing sebum, microorganisms, and keratin into the dermis.

Neutrophils, lymphocytes, and foreign body giant cells accumulate and form the erythematous papules, pustules, and nodular edemas characteristic of inflammatory acne.

Clinical Features

The clinical features of acne are a collection of features associated with distended, inflamed, or scarred pilosebaceous units. Lesional polymorphism is the main feature and is most commonly seen on the face, back, and chest. Seborrhea is the most common feature. Distended pilosebaceous units may take the form of open or closed comedones, and the types of inflammatory lesions seen include pustules, papules, nodules, and cysts. In more severe cases, multiple inflammatory papules and nodules coalesce to form draining sinuses, leading to chronic scarring and, rarely, malignancy. Postinflammatory lesions may also occur, represented by macular pigmentation and scarring (hypertrophic, keloid, depressed fibrous and atrophic macules, perifollicular elastolysis). Postinflammatory hyperpigmentation is usually seen in pigmented skin.

Assessing the severity of acne helps to determine the appropriate treatment. There are many scoring systems, but the Revised Leeds Acne Score (a numerical graphical scoring system) appears to be the most accurate, reproducible and rapid.

Management should include safe treatment, reducing psychological burden through emotional and social support, and clarifying common misconceptions about the disease.

Treatment should be initiated as early as possible to minimize the risk of scarring or adverse psychological effects. It should be aimed at reducing noninflammatory lesions that may be precursors to inflammatory lesions, improving existing inflammation, and reducing the P. acnes population. Treatment should be tailored to the individual patient, the type of acne, its severity, the patient's ability to use treatment, and their psychological state. It is important to emphasize to the patient from the outset that acne treatment is a long-term undertaking.

Advice on the use of cosmetics, moisturizers, sunscreens, and hair gels may be appropriate, as some formulations are greasy and may aggravate existing acne or even cause acne-type lesions. Treatment of mild acne. Topical preparations are the mainstay of therapy and their main action is to prevent new lesions. They act slowly and must be continued to prevent recurrence. Topical agents are only active where and when they are applied and should therefore be applied daily to all acne-prone areas of the skin. Maintenance therapy is essential to prevent recurrence. Available topical agents include benzoyl peroxide, antibiotics, azelaic acid, or retinoids. Topical antibiotics such as clindamycin, tetracycline, and erythromycin are bacteriostatic against P. acnes and are effective in mild to moderate inflammatory acne. Topical retinoids, such as tretinoin and adapalene, correct follicular keratinocyte abnormalities. They are effective in both treating inflammatory lesions and preventing comedone formation. They may also reduce inflammation by interfering with the interaction between toll-like receptor 2 and the extrinsic products of P. acnes on the surface of antigen-presenting cells. In addition, topical retinoids improve the penetration of other topical medications and may help reduce the hyperpigmentation that remains in dark skin types after inflammatory lesions resolve. The maximum therapeutic response to topical retinoids is achieved after about 12 weeks. They may cause local irritation, increased sensitivity to sunlight, and exacerbation of inflammatory lesions. Combination drugs such as erythromycin/zinc, erythromycin/tretinoin, erythromycin/isotretinoin, erythromycin/benzoyl peroxide, and clindamycin/benzoyl peroxide are increasingly used and are useful in reducing the development of antibiotic resistance in P. acnes.

Most of these topical preparations are available in a variety of dosages and delivery systems. Drying agents (gels, washes, and solutions) are particularly suitable for oily skin, while creams, lotions, and ointments are more suitable for patients with dry, easily irritated skin.

Treatment of moderate acne. Oral antibiotics are the standard treatment for moderate acne and in cases where topical combinations are not tolerated or effective. They have been shown to reduce P. acnes . In addition to interfering with the growth and metabolism of propionibacteria, antibiotics have anti-inflammatory activity by reducing and inhibiting cytokine production, affecting macrophage function,

and inhibiting neutrophil chemotaxis. The main systemic antibiotics are erythromycin and various types of tetracyclines. They have a long history of proven effectiveness in the treatment of inflammatory acne. Erythromycin (a macrolide) should be prescribed in cases where tetracyclines are not tolerated or are contraindicated: for example, during pregnancy, breastfeeding, and in children under 8–12 years of age.

First-generation tetracyclines (tetracycline hydrochloride, oxytetracycline) or second-generation tetracyclines (doxycycline, lymecycline, or minocycline) should be considered as first-line oral antibacterial therapy. Tetracycline is inexpensive and often effective in previously untreated cases, but gastrointestinal side effects and the need to take it on an empty stomach are undesirable.

One of the advantages of second-generation tetracyclines is their improved absorption, which is not affected by food. This may improve compliance with second-generation tetracyclines, especially in adolescents. Doxycycline is cleared by the liver, allowing this treatment to be used in patients with renal failure. Co-trimoxazole and trimethoprim have been used as third-line agents in the treatment of acne when other systemic antibiotics are contraindicated or there is documented resistance to other drugs. Treatment is recommended to be continued for up to three months. If there is little response after six weeks, consideration should be given to adding a topical non-antibiotic or switching to an alternative oral antibiotic. Once acne control has been achieved and maintained for at least two months, an attempt can be made to reduce the dose. The ultimate goal is permanent discontinuation followed by long-term topical therapy.

Antibiotic resistance is a problem and one of the major contributing factors is widespread inappropriate use (e.g. inadequate potency, inadequate duration of treatment and/or non-compliance). This may lead to therapeutic failure in some patients. However, resistance rates have recently decreased as a result of changes in prescription policies. If tetracycline resistance is suspected, switching to minocycline is recommended as resistance is rare.

Conclusion: Acne may not be life-threatening, but it has lifelong psychosocial consequences. People with acne and acne scars often develop anxiety and depression. Acne scars are almost impossible to repair. A Swedish study suggests that acne in teenage boys may be a risk factor for prostate cancer later in life.

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