

Overview of Management of Acne

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Received: January 04, 2020; **Published:** January 22, 2020

Abstract

Introduction: Acne vulgaris has become one of the most commonly seen conditions in the recent past. Acne has a very negative impact on the patient's mental and physical being, hampering the quality of life and is commonly accompanied by low self-esteem. The etiopathology of acne has a lot of factors that include increase in the rate of sebum production, abnormal keratinization of follicles and inflammation. There is a variety of drugs and combinations present in the market for the treatment.

Aim of the Study: This review aims to study various treatment options of acne vulgaris and gives an overview of the drugs and treatments available for acne vulgaris.

Methodology: This review is a comprehensive research of PUBMED from the year 1980 - 2019

Conclusion: There are various modalities of treatment for Acne vulgaris ranging from topical to systemic antibiotics, antifungals, and retinoids. Topical antibacterials are the first choice of treatment for mild to moderate acne and if no results are seen can be followed by systemic treatment. The main disadvantage of antibiotics as a treatment option is the increased rate of resistance developed by P. acnes and hence combination therapy is recommended. The association between diet and acne has not been proved yet and needs more research to support the data.

Keywords: *Acne Vulgaris; Retinoids; Chemical Peel; Comedones; Tea Tree Oil*

Introduction

Acne vulgaris has become one of the most commonly seen conditions in the recent past. Acne has a very negative impact on the patient's mental and physical being, hampering the quality of life and is commonly accompanied by low self-esteem. Acne vulgaris can be defined as an inflammatory pilosebaceous unit disorder and is most commonly seen in the population of the adolescent age group. The lesions most commonly seen are either open or closed, which are called black and white respectively, papules, nodules, and cysts [1]. The etiopathology of acne has a lot of factors that include increase in the rate of sebum production, abnormal keratinization of follicles and inflammation. Acne leads to scarring and changes in pigments on the face [2].

Acne lesions are mostly distributed around the face, neck, chest, and upper back. The severity of acne is also determined by the distribution, the kind, and presence of scarring, and the number of lesions that are present. There is a lot of variations present in acne that can be seen namely, acne mechanica, acne fulminans, acne induced by a drug, neonatal acne and occupational acne. Acne can be confused with other skin diseases, and the differential diagnosis that can be done for acne are folliculitis, keratosis pilaris, perioral dermatitis, and rosacea [3].

Causes of acne

To understand the causes of acne, the first most important thing is knowing the history of the disease; the history was given by the patient to help determine if there is an underlying medication or exacerbating factor that causes increase in androgens in the body leading to acne. Endocrine tests are generally ordered to be done in older women if they have a complaint of acne as compared to younger women [2]. Ultrasonogram can be done for the pelvic region to rule out polycystic ovarian disease as that can be one of the main reasons for breakout of acne [4].

Treatment strategy for acne should have a multi-focused approach and aim at decreasing the intensity, recurrence, and making the appearance better. The patient's age, outcome expectation, approach towards any previously taken treatment basically determine the kind of treatment to be taken. The various treatment strategies used in treating acne aim at different steps in the pathogenesis, starting

from counteracting inflammation, androgen, reduction in the production of sebum, and reduce the proliferation of *P. acnes*. The research studies that have been done on acne are mainly small clinical trials where a particular drug is compared with placebo or where different formulations and dosages of the same drug are seen on different populations [5].

Topical treatment options

Topical treatment in the form of retinoids, antimicrobials, and antibiotics are mainly used in acne. They help in the reduction of mild to moderate acne. They prevent the occurrence of new acne and are active where the application has been made. They are available in different suspensions like gels, pledgets, solutions, and help in drying the excess oil for oily skinned people. For people with dry skin, they are infused in lotions, creams, and various ointments. Topical preparation requires a month or more to show any significant change and can be used for a longer period of time also [5].

Retinoids

Retinoids are used on follicular keratinocytes to prevent blockage of the follicles and increased cornification. The main aim is to target the microcomedones, and such treatment greatly reduces the frequency of it [1]. Allergic reaction to retinoids can be seen in the form of irritation and redness, and hence the patient is advised to apply a very little quantity initially. The most commonly used retinoids are tretinoin, adapalene, and tazarotene. The concentration of drug used also decides the effect caused by it; the general recommendation is to start from a lower concentration and increase gradually [6].

Antimicrobials

Antimicrobials used topically are benzoyl peroxide and antibiotics, which are effective in treating inflammation. Benzoyl peroxide acts on *P. acnes* and kills it by releasing oxygen in the follicle. The main drawback associated with benzoyl peroxide is the bleaching ability that it has, it tends to bleach any piece of clothing that it comes in contact with, and hence the patients should be warned beforehand [1].

Antibiotics like clindamycin and erythromycin have also been used topically to reduce inflammatory lesions. Although many clinical trials have shown it to be very potent if used very regularly, *P. acnes* become resistant to it. In such cases of resistant microbial traits, monotherapy is not suggested, and antibiotics in a combination of benzoyl peroxide are recommended [7].

Combination therapy for the treatment of acne

A combination of antibiotics and antimicrobials or retinoids and antibiotics has proven to be more effective than monotherapy [8]. The main point to be kept in mind during usage of combination drugs their compatibility amongst each other. In a study conducted by Wolf et al., they concluded that clindamycin in the concentration of 0.1% when used alone was less effective than clindamycin and adapalene gel used together [8]. When inflammatory lesions are present, benzoyl peroxide, in combination with retinoids plays an important role [9].

Over the counter drugs for acne

Over the counter treatment is very common for a condition like acne, in cases of mild to moderate acne, the patient first seeks self-treatment and buys drugs over the counter. The most used product present over the counter is Proactive, which contains benzoyl peroxide in the concentration of 2.5%. It helps in reducing irritation and cleansing the area. Salicylic acid is also used by patients who are allergic or are intolerant to Benzoyl Peroxide. Salicylic acid can be used as a wash and is seen to be effective but strong research evidence is lacking in support of salicylic acid. The correlation of acne with frequency of face washing and poor hygiene is not very clear, but patients are nevertheless advised to clean their face regularly with a mild soap that contains mild antibacterial like benzoyl peroxide [10]. Patients have to keep in mind while purchasing makeup products that they should be oil-free and should not contain comedones [11].

Systematic treatment for acne vulgaris

Systematic treatments like oral antibiotics, hormonal therapy, and isotretinoin can be given for patients who have moderate to severe acne and are not responding to topical treatments.

Oral antibiotics are effective in cases where the acne lesions are widespread, and topical treatment is not showing much difference [12]. Oral antibiotic is a slower treatment, and a normal response to the antibiotic is only seen after 1 to one and a half months [3]. Topical retinoids, when mixed with oral antibiotics give a better result as compared to both of them being used alone as a monotherapy [2] but increased usage of oral antibiotics for mild acne cases is not recommended due to high chances of resistance. Tetracycline and erythromycin together can be used against *P. acnes* and has an anti-inflammatory effect by inhibiting production of bacterial-induced cytokines [13].

Doxycycline and Minocycline show a better effect than tetracycline, Erythromycin is also used for patients who are allergic to tetracycline, but resistance rate is very high [11]. Hormonal therapy, like estrogen-containing oral contraceptives are also used for women who have acne without any underlying hormonal abnormalities. A reduction rate of 60% in acne lesions is seen in women consuming oral contraceptives. In case of androgen excess being the cause of acne, antiandrogen therapy using spironolactone has been shown to give very good results [11]. Isotretinoin is shown to counteract all causes of acne like abnormal keratinization of follicles, acts as an anti-inflammatory, decreases sebum production and decreases the colony-forming ability of *P. acnes*. Isotretinoin treatment should be done in only extreme cases where the patient is not reacting to topical and oral antibiotics because side effects include teratogenicity, blood dyscrasias, cases of Steven-Johnson syndrome and toxic epidermal necrolysis have also been reported in few cases [14].

Alternate treatment options for acne

Ayurvedic treatment options and tea tree oil have also shown significant improvement in cases of acne, although there is limited data supporting its use. Tea tree oil shows a slower onset of action compared to topical antibacterials. Physical treatment like extraction of comedones, chemical peels, microdermabrasion, corticosteroid injection, photodynamic therapy, injectable fillers and laser resurfacing for scarring treatment. Small pilot studies have supported the use of chemical peels and corticosteroid injections for inflammatory lesions [2].

Modernization in acne treatment

Allylamine antifungal, when mixed with Benzoyl Peroxide has proven to give better results for Benzoyl Peroxide and avoids resistance. Dapsone gel in the concentration of 5% has also proven to be highly efficient in acne treatment and has shown the success of 40% in patients who have used dapsone gel twice daily on the affected area. It has especially shown good results in patients who have a glucose 6 phosphate deficiency [15].

Conclusion

There are various modalities of treatment for Acne vulgaris ranging from topical to systemic antibiotics, antifungals, and retinoids. Topical antibacterials are the first choice of treatment for mild to moderate acne and if no results are seen can be followed by systemic treatment. The main disadvantage of antibiotics as a treatment option is the increased rate of resistance developed by *P. acnes* and hence combination therapy is recommended. The association between diet and acne has not been proved yet and needs more research to support the data.

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Volume 16 Issue 2 February 2020

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