

## ACNE VULGARIS - AN OVERVIEW

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### ABSTRACT

Acne vulgaris is a chronic skin disease having an effect on more than 85% of adolescents and young adults. It is one of the most common dermatological conditions affecting humankind across the globe and its impact on quality of life is important. Facial acne is associated with severe negative influence on the quality of life. It affects the appearance of the individual which makes it more irking than acne at other sites. Acne vulgaris is multifactorial in origin and a complex interplay of several factors affect the severity of acne. Treatment of acne vulgaris is directed towards elimination of comedones by normalization of follicular keratinization, decreasing sebaceous gland activity decreasing the population of Propionibacterium acnes and decreasing inflammation. This article attempts to review the disease Acne vulgaris, along with its management.

**KEYWORDS:** Acne vulgaris, Adolescents, Quality of life.

### INTRODUCTION

Acne vulgaris is a common skin disease affecting approximately 9.4% of the world's population with the highest prevalence in adolescents. It affects over 90% of males and 80% of females in all ethnic groups.<sup>[1-2]</sup> It affects 85% of adolescents and young adults.<sup>[3]</sup> Acne is associated with greater psychological burden.<sup>[4]</sup> Acne is neither life threatening nor physically debilitating, but it can affect social and psychological functioning of affected people and lead to the deterioration of their quality of life. Moderate to severe acne lesions may leave post inflammatory hyper pigmentation and/or atrophic scars that can affect the quality of life and lead to reduced self esteem, and less social interaction with others.<sup>[5]</sup> Also it can lead to anxiety, depression, and other emotional trauma that threaten the quality of life.<sup>6</sup> It is a chronic inflammatory disease of pilosebaceous units, characterised by seborrhea, open comedones, papules, pustules, and in more cases nodules, pseudocysts and scarring.<sup>[7]</sup>

### History<sup>[8]</sup>

The word 'Acne' appears to evolve from the Greek word 'acme' which means 'point or spot'. In the ancient Greek writings of the Byzantine Physician, Aetius Amidenus, the earliest description of acne appeared. In some Egyptian writings, it is mentioned that the Pharaohs suffered from acne and had also made some efforts to resolve it.

Ancient Romans have guided initial treatment of acne by treating with baths, as people there believed that the pores of the skin may be lifted and cleaned with a mixture of Sulphur in the mineral baths. Description of a dermatological condition 'Busoore labaniya' is available in the exemplary texts of Greco-Arabic scholars, with clinical resemblance to present day 'Acne vulgaris'. In the Elizabethan era, the appearance of women was given primordial importance and Acne at that time was also contributed to witchcraft. For the management of the pimples, different types of mercury make up was also in use during that period. Treatment of acne with topical crushed dry ice (termed Cryoslush) was described in 1907, but it is no longer performed commonly.

### Definition

"Acne vulgaris can be defined as a self-limiting disease of sebaceous glands manifesting generally in adolescence with pleomorphic lesions like comedones, papules, pustules, nodules and cysts. Extensive scarring can occur".<sup>[9]</sup>

### Epidemiology

- **Age:** The peak incidence is between fourteen to seventeen years in women and sixteen to nineteen years in men.<sup>[10]</sup>
- **Gender:** Acne is commoner and more severe in males than in females, relating it to androgen

activity. Acne was found to be more common in urban boys than in their rural counterparts.

- **Genetic factors:** Children with acne have one or both parents with acne in forty five percent of the cases. Racial predisposition and similarity of lesions in monozygotic twins are also due to genetic factors.<sup>[11]</sup>

### Etiology and Pathogenesis

Acne vulgaris is multifactorial in origin and a complex interplay of several factors affect the severity of acne. The key components are alteration in the pattern of keratinization within the sebaceous follicles, circulating sex hormones, quality and quantity of sebum secretion and colonization of pilosebaceous ducts by *Propionibacterium acnes*, a Gram-positive, rod-like bacterium which in turn causes inflammation; and hyperconification and occlusion of pilosebaceous ducts.<sup>[12]</sup>

### Sequence of Events

- Sebaceous follicle the target organ of acne, has large, multi-lobular sebaceous glands and rudimentary hair structure.<sup>[13]</sup>
- Blockage of the sebaceous canal due to altered keratinization leads to retention of sebum (comedone formation) and initiation of the inflammatory response.
- An increase in the microbial flora increases inflammation (papule and pustule formation). Further retention of sebum and release of enzymes cause rupture of the sebaceous gland.
- The resultant spread of sebum in the dermis adds to inflammatory cell collection in the dermis (nodule formation).
- Confluence of affected glands result in accumulation of larger areas containing pus, fluid and glandular debris (cyst formation).
- A scar results when such inflamed lesion and cysts heal after rupture or absorption of fluid.<sup>[14]</sup>

### Clinical Features

- Comedone - a conical raised lesion with a broad base and a plugged apex : open comedones (black heads) and closed comedones (white heads).<sup>[15]</sup>
- Inflammatory lesions include macules, papules, pustules, papulopustules, nodules, pseudocysts and sinus tracts.<sup>[16]</sup>
- Scarring,<sup>[17]</sup> & Oily skin (seborrhea oleosa).<sup>[18]</sup>
- Common sites - face, mid-chest, back, shoulders and upper arms.<sup>[19]</sup>

### GRADING OF ACNE<sup>[20]</sup>

Grade I (Mild): Comedones, occasional papules

Grade II (Moderate): Papules, comedones, few pustules

Grade III (Severe): Predominant pustules, nodules, abscesses

Grade IV (Cystic): Mainly cysts, abscesses widespread scarring

### Clinical Variants Of Acne<sup>[21]</sup>

- **Acne conglobata:** It is a rare condition, usually affecting adult males, and most commonly occurs on trunk and upper limbs, characterized by comedones, nodules, abscesses, sinuses and cysts, usually with marked scarring. It may be associated with hidradenitis suppurativa, scalp folliculitis and pilonidal sinus.
- **Acne fulminans:** A rare but severe presentation of acne, associated with fever, arthralgias and systemic inflammation, with raised neutrophil count and plasma viscosity. It is usually found on the trunk in adolescent males. Costochondritis can occur.
- **Acne excoriee:** Describes self-inflicted excoriations due to compulsive picking of pre-existing imagined acne lesions. It usually affects teenage girls and underlying psychological problems are common.
- **Secondary acne:** Comedonal acne can be caused by greasy cosmetics or occupational exposures to oils, tars or chlorinated aromatic hydrocarbons. Predominantly pustular acne can occur in patients using systemic or topical corticosteroids, oral contraceptives, anti convulsants, lithium or antineoplastic drugs, such as the epidermal growth factor receptor (EGFR) inhibitor, cetuximal. Acne is a common feature of polycystic ovary syndrome.

### Treatment

#### Aims of Treatment<sup>[22]</sup>

1. To reduce the follicular bacterial population, and to reduce lipase.
2. To remove the follicular obstruction
3. To reduce inflammation
4. To decrease the sebaceous gland activity by blocking androgen stimulation

#### Steps of treatment in Acne vulgaris<sup>[23]</sup>

1. Diagnosis education of patient and general measures
2. Assessment of severity and need for therapy
3. Start appropriate therapies like:

**a. Topical therapy:** Minimal to moderate, pauci-inflammatory disease may respond adequately to local therapy alone.<sup>24</sup> It includes cleansing, topical acne preparations such as retinoic acid, benzoyl peroxide or salicylic acid, topical antibiotics like tetracycline, chloramphenicol, erythromycin or clindamycin, topical anti androgens, newer topical agents like azelaic acid, nicotinamide, alpha hydroxy acids and retinoids (tazarotene and adapalene).

**b. Physical modalities:** It include intralesional steroids, phototherapy and radiation therapy.

**c. Systemic therapy :** Patient with moderate to severe acne with prominent inflammatory component will benefit from the addition of systemic therapy.<sup>25</sup> The systemic therapy for acne includes antibiotics and antibacterial agents, estrogens and anti androgens, systemic corticoids, oral zinc therapy and oral retinoids.<sup>[26]</sup>

**4. Treatment of scars:** Keloid scars may respond to intralesional steroid and /or silicone dressings, carbondioxide laser, microdermabrasion, chemical peeling or localized excision.<sup>[27]</sup>

#### General Measures

1. Careful examination of the patient with emphasize on his/her family history, the nature and course of the disease, different modalities of the treatment available, their limitations, likely duration of the treatment and importance of the patient's adherence to a particular regimen.
2. Avoid acneogenic drugs, oil, pomades and heavy cosmetics.
3. Eliminate emotional stress by reassurance
4. Ask for any premenstrual flare and seasonal variation
5. Assess for endocrine abnormality.<sup>[28]</sup>

#### ACNE SURGERY<sup>[29]</sup>

Indications for acne surgery are

1. Open and closed comedones
2. Pustules, cysts and nodules
3. Acne scars: Crater, Pit, Ice pick, Atrophic, Hypertrophic, Keloid
4. Post-acne hyperpigmentation

The types of acne surgeries are

- 1) Comedone extraction
- 2) Electrofulguration and electrodesiccation
- 3) Incision and drainage
- 4) Evacuation surgery
- 5) Cryosurgery
- 6) Chemical peeling
- 7) Punch techniques
- 8) Subcision
- 9) Scalpel excision technique
- 10) Soft tissue augmentation
- 11) Intralesional steroid
- 12) Combination of liquid nitrogen cryosurgery and intralesional steroids
- 13) Shave excision
- 14) Laser surgery
- 15) Dermabrasion
- 16) Electrical stimulation of skin
- 17) Excision of epithelialized sinuses
- 18) Silico gel sheeting
- 19) Newer surgical modalities
  - o Iontophoresis with estriol or tretinoin
  - o Recollagenation of acne scars
  - o Microdermabrasion

#### DISCUSSION

Profound social disability can be produced by acne and hence it needs to be taken care of. Acne vulgaris is dependent on diverse factors and hence diverse therapeutic modalities exist. Treatment of acne vulgaris is directed towards elimination of comedones by normalization of follicular keratinization, decreasing sebaceous gland activity decreasing the population of P.

acnes and decreasing inflammation. With proper treatment essential control of lesions can be attained and dreadful sequelae of the disease can be prevented. Modes of therapy will be determined not only by the severity of the disease, but also by the needs of the patient. The major problem is cosmetic disfigurement. In order to identify patients with poor self image who may benefit from more potent treatment and to evaluate the effect of treatment, the 'Acne disability Index' was found useful. There is no convincing evidence to support a casual association between diet and acne. The physiological impact of acne must not be underestimated and should be considered in management decisions.<sup>[30]</sup>

#### CONCLUSION

Acne vulgaris is widespread across the world. Acne consistently represents the top three most prevalent skin conditions in the general population, as found in large studies within the UK, France, and the USA.<sup>[31-33]</sup> It is a common health problem affecting adolescents with considerable impact on their quality of life. According to the Global Burden of Disease (GBD) study, acne vulgaris affects ~85% of young adults aged 12–25 years.<sup>[34]</sup> Acne results from a complex interplay of increased sebum production, ductal hyperconification, follicular colonisation with Propionibacterium acnes, and inflammation. Acne lesion begins with the microcomedo, a microscopic lesion not visible to the naked eye. With time, the follicle fills with lipids, bacteria and cell fragments.<sup>[35]</sup> The burden rate of acne vulgaris continues to increase in almost all countries. Understanding the specific characteristics of acne vulgaris is essential to formulate more effective and targeted interventions for controlling acne burden.

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