WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 22, 612-620. Review Article ISSN 2277–7105

COSMETICS AND ACNE: A COMPREHENSIVE REVIEW

Dhiraj Surendra Bhoyate*, Tapkir Sakshi Arun, Dhiraj Santosh Khetmalis, Rajkumar Digambar Datir and Manoj Valmik Ithape

Hon. Shri. Babanrao Pachpute Vichardhara Trust's Group of Institutions Faculty of Pharmacy Kashti, Tal- Shrigonda, Dist- Ahemadnagar -414701 (College Code-5303).

Article Received on
02 October 2024,

Revised on 23 October 2024,
Accepted on 12 Nov. 2024

DOI: 10.20959/wjpr202422-34656

***Corresponding Author**
Dhiraj Surendra Bhoyate
Hon. Shri. Babanrao Pachpute Vichardhara Trust's Group of Institutions Faculty of Pharmacy Kashti, Tal- Shrigonda, Dist- Ahemadnagar -414701 (College Code-5303).

ABSTRACT

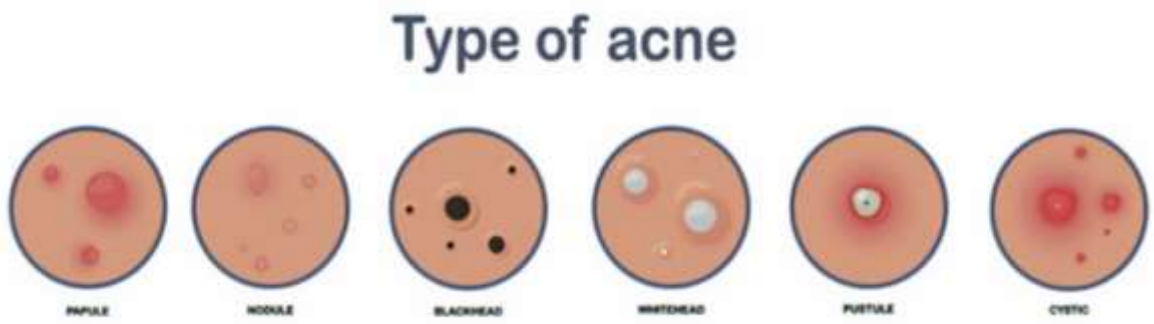
This review looks at the complex relationship between cosmetics and acne, showing the positive and negative consequences of different cosmetic chemicals and products. We go over the pathophysiology of acne, cosmetic dermatology, and tips for acne-prone people.

KEYWORDS: Acne, acne-causing and acne-fighting cosmetic components, Cosmatics therapies.

INTRODUCTION

Acne is a common skin problem that causes emotional suffering as well as physical discomfort for millions of people throughout the world. Cosmetics, an essential component of everyday skincare routines, play an important role in acne control. However, the link between cosmetics and acne is intricate and nuanced. On the one hand, cosmetics can worsen acne by clogging pores, irritating the skin, and spreading bacteria. Certain substances, like mineral oil and petrolatum, can cause blackheads and whiteheads. On the other side, some cosmetics can help with acne symptoms. Products containing benzoyl peroxide, salicylic acid, and tea tree oil have been shown to alleviate acne symptoms. Moisturizers and sunscreens can also aid to maintain skin pH and reduce irritation. Understanding the relationship between cosmetics and acne is critical for successful skin maintenance.

1. Study the pathogenesis of acne.
2. Determine the acne-causing and acne-fighting cosmetic components.
3. Study of Cosmatics therapies.
4. Make recommendations for acne-prone individuals.

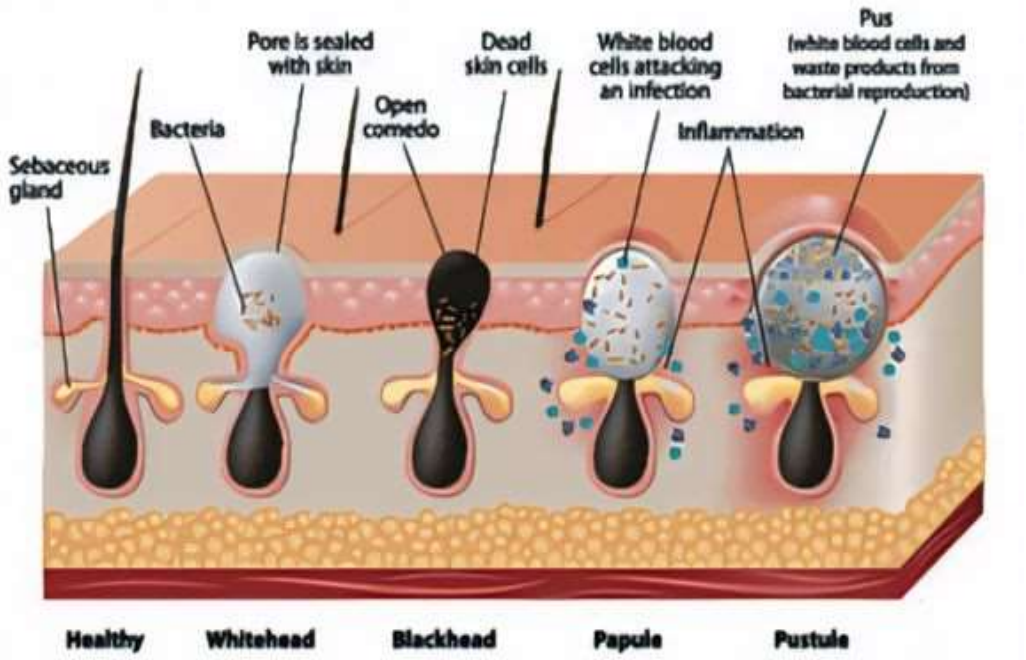


Pathophysiology of Acne

Acne is a complex, multifactorial disorder involving the interplay of various physiological and pathological processes. The pathophysiology of acne begins with hyperkeratinization, where excessive keratin production leads to follicular occlusion, blocking the sebaceous follicle and preventing sebum from flowing freely. Concurrently, sebaceous glands produce excessive sebum, fueled by hormonal influences such as androgens, which stimulate sebaceous gland activity, and estrogen, which regulates it. Insulin also plays a role, affecting sebaceous gland activity and inflammation. As sebum accumulates, it creates an anaerobic environment conducive to the growth of Propionibacterium acnes (P. acnes) bacteria, which thrive in the follicle and produce lipases and inflammatory mediators.

As P. acnes bacteria proliferate, the immune system responds, triggering inflammation and attracting white blood cells to the affected area. This inflammatory response leads to the characteristic symptoms of acne, including redness, swelling, and pus. The combination of follicular occlusion, sebum accumulation, bacterial growth, and inflammation ultimately results in the formation of various types of acne lesions, such as comedones (blackheads and whiteheads), papules, pustules, nodules, and cysts. Genetic predisposition, stress, diet, environmental factors, and certain medications can also contribute to the development and severity of acne.

Understanding the pathophysiology of acne informs treatment strategies, which often target specific factors, such as preventing follicular occlusion with topical retinoids, reducing P. acnes growth with benzoyl peroxide, regulating hormonal imbalances with hormonal therapies, and alleviating inflammation with anti-inflammatory agents. By addressing the underlying causes of acne, effective treatments can mitigate symptoms, prevent scarring, and improve quality of life for individuals affected by this pervasive skin condition.



Causes

Acne is a complex skin condition caused by a range of factors. Acne is caused primarily by hyperkeratinization, increased sebum production, and bacterial growth. Hyperkeratinisation occurs when dead skin cells combine with keratin, blocking sebaceous follicles and preventing sebum from flowing freely. Hormonal fluctuations, particularly androgen surges during puberty, menstruation, pregnancy, and menopause, stimulate sebaceous glands, resulting in increased sebum production. Propionibacterium acnes (P. acnes) bacteria thrive in the follicle, feeding on sebum and producing lipases and inflammatory mediators. Additional factors that contribute to acne include: Genetics: Family history is a crucial factor. Stress induces hormonal changes. Diet: Consuming dairy, refined carbohydrates, and processed foods. Pollution, humidity, and certain chemicals are all examples of environmental influences. Antidepressants, corticosteroids, and testosterone are all drugs. Personal hygiene habits: poor

How does acne affect people?

Acne causes physical symptoms such as discomfort, itching, and pain, but its primary impact is on quality of life. Acne affects highly visible skin—a vital organ of social display; popular culture and societal pressures dictate blemishless skin; acne can be dismissed by health-care professionals as a trivial self-limiting condition; and acne peaks in adolescence, when confidence and self-esteem are crucial. Case-control and cross-sectional studies examining

the impact of acne on psychological health discovered a variety of abnormalities, including depression, suicidal ideation, anxiety, psychosomatic symptoms, humiliation, embarrassment, and social inhibition, all of which improve with effective therapy. Anger is inversely correlated with acne quality of life and treatment satisfaction. Patients may not disclose depression symptoms and require urging during consultations. UK teenagers with acne were twice as likely to score in the borderline or abnormal range on an age-appropriate validated assessment of emotional well-being, and had higher levels of behavioral difficulties compared to those without acne. A case-control study of young men and women found an association between acne and unemployment. A study of 14-17-year-old Australian students found no link between acne and psychological or psychiatric morbidity. This finding could be explained by effective treatments or personality factors. Acne severity does not always correlate with psychological impairment. A person with minor acne may experience significant levels of psychological disability, whereas someone with severe acne may appear less affected. Studies on psychological morbidity in acne have typically been cross-sectional, making it difficult to determine causality. Few research address the direct and indirect costs of acne.

Cosmatics Ingredient and Acne

1. Acne-causing cosmatic ingredients

Certain components in skincare and cosmetic items can clog pores, irritate the skin, and cause acne. Comedogenic substances include mineral oil, petrolatum, isopropyl myristate, lanolin, and parabens, which can clog pores and create comedones. Sulfates, artificial scents, and colors can deplete skin's natural oils, resulting in dryness and irritation. Other acne-causing substances are: Coal tar can cause follicular occlusion. Sulfonamides can irritate the skin and cause irritation. Formaldehyde-releasing substances can alter the skin's natural pH equilibrium. Phthalates can promote sebum production. Synthetic perfumes can irritate the skin and cause irritation.

- Mineral oil
- Petrolatum
- Isopropyl myristat
- Lanolin
- Parabens
- Sulfates
- Artificial fragrances
- Dyes

2. Acne-Fighting Cosmetic Ingrdients

Effective acne-fighting cosmetic chemicals work at different phases of acne formation,

lowering inflammation, preventing clogged pores, and eliminating bacteria. Salicylic Acid (BHA), a beta-hydroxy acid, exfoliates skin, clears clogged pores, and lowers inflammation, making it perfect for blackheads and whiteheads. Benzoyl Peroxide, a powerful antibacterial agent, eliminates Propionibacterium acnes (P. acnes), decreases inflammation, and prevents scarring. Glycolic Acid (AHA) is an alpha-hydroxy acid that exfoliates skin, brightens the complexion, and lowers acne severity. Tea Tree Oil, a natural antibacterial and anti-inflammatory agent, lowers inflammation and helps prevent acne. Niacinamide increases skin hydration, decreases irritation, and shrinks pores. Retinoids can help avoid follicular occlusion, minimize acne, and enhance skin texture. Sulfur, a natural antibacterial and antifungal agent, decreases sebum production and helps prevent acne.

- Salicylic acid
- Glycolic acid
- Zinc
- Benzoyl peroxid
- Tea tree oil
- Niacinamide
- Retinoids

Cosmatics Dermatology

1. Lesser Therapy

Acne laser therapy uses high-intensity light to target and destroy acne-causing germs while also reducing inflammation and preventing scarring. Several laser technologies are used, including blue light therapy, pulsed dye laser, Nd:YAG laser, and diode laser. Blue light therapy, which emits wavelengths between 420 and 450 nm, kills Propionibacterium acnes (P. acnes) germs, and red light therapy (630-660 nm) decreases inflammation. The pulsed dye laser (585-600nm) targets blood vessels to minimize inflammation, while the Nd:YAG laser (1064nm) and diode laser (800-980nm) go deeper to reduce scarring. Treatment sessions last 15-60 minutes and are scheduled 1-4 weeks apart. Typically, 3-6 sessions are required. Benefits include less severe acne, better skin texture, smaller pores, and long-term results. Temporary side effects may include redness, swelling, dryness, and skin sensitivity. Types of Laser Treatments:

2. Skin Needling

SKin needling, also known as collagen induction therapy, uses vertical needle punctures instead of horizontal ones used in subcision. It can heal rolling and boxcar scars. A tiny roller with needles ranging from 0.5 to 3.0 mm in length is used to gently puncture the skin's surface layers, loosening fibrotic adhesions and stimulating collagen synthesis. This procedure can be repeated within a single session or over multiple sessions, depending on

scar depth and quality. It has been shown to reduce scar depth by up to 25% after just two sessions.

3. Radiofrequency

Nonablative radiofrequency (RF) is a relatively novel technique that creates an electric current in the dermis at preset depths to induce thermal damage and eventual collagen synthesis. There are a range of modalities for which RF can be applied, but microneedle bipolar RF and fractional bipolar RF treatments offer the best results for atrophic acne scars. Improvements in scar appearance of 25% to 75% have been recorded after numerous treatment sessions. Better results have been reported in the treatment of ice pick scars as opposed to more superficial scars, although additional studies will be essential to substantiate this claim. Adverse effects include transient erythema and post-treatment scabbing.

4. Punch Techniques

Punch techniques can effectively heal deeper atrophic acne scars that other treatment methods fail to address. The procedure begins with a punch excision that is roughly equivalent to the scar size, followed by either excision of the scar tissue with subsequent suturing, graft replacement of the excised tissue, or elevation of the already developed scar tissue to the level of surrounding skin where it is then kept in place by sutures or adhesive skin closure material. Success rates with this method are mostly limited to case series, although punch techniques are known to be effica- cious, especially for treatment of ice pick scars. Risks associated with this procedure include graft failure, depression, and sinus tract development.

5. Cryotherapy

Contact cryotherapy has been researched for treating hypertrophic acne scars. Scar reduction is believed to be due to collagen restructurement produced by freezing and thrombosis, while the exact process remains unknown. One study found that cryotherapy provided good or outstanding results in 76% of instances. Permanent pigmentary changes are a potential AE.

Tips for acne-prone people

Begin by washing gently, exfoliating 1-2 times per week, and moisturizing with oil-free products. Use salicylic acid, benzoyl peroxide, or tea tree oil-based treatments. Maintain a balanced diet, remain hydrated, exercise, and minimize stress. Chemical peels, laser therapy, and blue light therapy are among professional procedures that can be beneficial. Picking, squeezing, or applying thick makeup might irritate your skin. Consider using natural medicines like aloe vera and green tea. Consult a dermatologist for tailored advice on reducing acne severity, preventing scarring, and improving skin health.

Skincare Routine

1. Cleanse face twice a day with gentle, non-comedogenic cleanser.
2. Use lukewarm water instead of hot water.
3. Pat dry, don’t rub.
4. Exfoliate 1-2 times a week with alpha-hydroxy acids (AHAs) or beta-hydroxy acids (BHAs).
5. Apply toner to balance pH.
6. Use oil-free, non-comedogenic moisturizer.

Products

1. Cleansers: Cetaphil, Neutrogena, Paula's Choice.
2. Exfoliants: Glycolic acid, salicylic acid, lactic acid.
3. Moisturizers: Hyaluronic acid, ceramides, niacinamide.
4. Sunscreen: Broad-spectrum, SPF 30+, non-comedogenic.

Lifestyle Changes

1. Maintain good hygiene.
2. Eat balanced diet rich in fruits, vegetables, whole grains.
3. Stay hydrated (8-10 glasses of water).
4. Exercise regularly.
5. Manage stress.

Consult a Dermatologist

1. For personalized advice.
2. To determine acne severity.
3. To discuss treatment options.
4. To address concerns.

CONCLUSION

Acne is a complex skin problem caused by a mix of variables such as excessive sebum production, clogged pores, bacterial overgrowth, and inflammation. Understanding the pathophysiology of acne and utilizing acne-fighting cosmetic compounds such as salicylic acid, benzoyl peroxide, and tea tree oil, while avoiding pore-clogging substances such as mineral oil and petroleum jelly, are required for effective management. Chemical peels, microdermabrasion, and laser treatments are among cosmetic therapies that can help to reduce the severity of acne. Acne-prone people should stick to a consistent skincare routine, avoid using comedogenic products, balance their diet, stay hydrated, exercise regularly, and manage stress. Individuals who combine these measures and seek dermatological advice can lessen the severity of acne, prevent scarring, and obtain radiant, healthy-looking skin.

REFERENCE

1. Ghodsi SZ, Orawa H, Zouboulis CC. Prevalence, severIty, and severity risk factors of acne in high school Pupils: a community-based study. J Invest Dermatol, 2009; 129: 2136-2141.

2. Collier CN, Harper JC, Cafardi JA, et al. The prevalence Of acne in adults 20 years and older. J Am Acad Dermatol, 2008; 58: 56-59.
3. Kim GK, Michaels BB. Post-adolescent acne in women: More common and more clinical considerations. J Drugs Dermatol, 2012; 11: 708-713.
4. Geller L, Rosen J, Frankel A, et al. Perimenstrual flare of Adult acne. J Clin Aesthet Dermatol, 2014; 7: 30-34.
5. Layton AM, Henderson CA, Cunliffe WJ. A clinical Evaluation of acne scarring and its incidence. Clin Exp Dermatol, 1994; 19: 303-308.
6. Halvorsen JA, Stern RS, Dalgard F, et al. Suicidal Ideation, mental health problems, and social impairment Are increased in adolescents with acne: a population-based Study. J Invest Dermatol, 2011; 131: 363-370.
7. Jacob CI, Dover JS, Kaminer MS. Acne scarring: a clas-Sification system and review of treatment options. J Am Acad Dermatol, 2001; 45: 109-117.
8. Rivera AE. Acne scarring: a review and current treatment Modalities. J Am Acad Dermatol, 2008; 59: 659-676.
9. Goodman GJ. Acne and acne scarring: why should we Treat? Med J Aust, 1999; 171: 62-63.
10. Frank W. Therapeutic dermabrasion. Back to the future. Arch Dermatol, 1994; 130: 1187-1189.
11. Grindlay D, Williams HC. Systematic reviews on acne vulgaris Since 1999—mapping by topic. (accessed Sept 13, 2010).
12. Degitz K, Placzek M, Borelli C, Plewig G. Pathophysiology of acne. J Dtsch Dermatol Ges., 2007; 5: 316–23.
13. Shalita AR. Acne: clinical presentations. Clin Dermatol, 2004; 22: 385–86.
14. Jacob CI, Dover JS, Kaminer MS. Acne scarring: a classifi cation System and review of treatment options. J Am Acad Dermatol, 2001; 45: 109–17.
15. Van Zuuren EJ, Gupta AK, Gover MD, Graber M, Hollis S. Systematic Review of rosacea treatments. J Am Acad Dermatol, 2007; 56: 107–15.
16. Rosas Vazquez E, Campos Macias P, Ochoa Tirado JG, Garcia Solana C, Casanova A, Palomino Moncada JF. Chloracne In the 1990s. Int J Dermatol, 1996; 35: 643–45.