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DIET AND ACNE

Sadaf Firdaus[1]*, Nabeela Sultan[1], Ammar Ibne Anwar[2] and Abdul Aziz Khan[2]

[1]PG Scholar, [2]Assistant Professor,
[1,2]Department of Tahaffuzi Wa Samaji Tib & [1]Department of Amraaz E Jild Wa Zohrawiya, Ajmal Khan Tibbiya College, Faculty of Unani Medicine, Aligarh Muslim University, Aligarh, India.

***Corresponding Author: Sadaf Firdaus**
PG Scholar, Department of Amraaz E Jild Wa Zohrawiya, Ajmal Khan Tibbiya College, Faculty of Unani Medicine, Aligarh Muslim University, Aligarh, India.

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ABSTRACT
Acne vulgaris is a disease of pilosebaceous unit which can be inflammatory or non-inflammatory with varying degree of scarring. It has devastating effect over patient psychological condition as it affects the physical appreance of the patient as well as create bad effects over quality of life. The diet may play a role in the development of acne. Acne breakout can be reduced or prevent by consuming more omega-3 fatty acids, fewer dairy products, and fewer foods with a high glycaemic index. Acne is the most common skin condition. It often begins during puberty, and it is especially prevalent between the ages of 12 and 24. According to the severity acne can be classified as mild, moderate and severe. Acne can be caused by excess sebum production, bacteria and hormones fluctuation. Certain foods such as raises IGF-1 factors can provoke the development of acne. In this article, we examine the effects of the diet on the skin and explore which foods might provoke or reduce acne breakouts.

KEYWORDS: Acne, Puberty, Hormone fluctuation, Glycaemic index.

INTRODUCTION
The role of diet in the pathogenesis of acne was surrounded by many controversies. In the 1930s maximum dermatology textbooks explained about the patients suffering from the dermatosis on the basis of clinical experiments that suggested a restrictive diet that rich in carbohydrates and sweets may cause worsening of acne. However, despite a general belief about the effectiveness of such practice, there was still too little evidence supporting the role of diet in the control of the course of acne.[1] Acne affecting millions of young adults worldwide and it is one of the most common dermatological conditions.[2]

The major etiologic factors for acne are as follows.

- Excess production of sebum.
- Hormones.
- Bacteria.
- Hyper proliferation of follicular cells.[3]
- Excessive follicular keratinization.
- Impaired corneocyte desquamation.
- Increased skin colonization by Propionibacterium acnes and the stimulating effect of hormones on the sebaceous glands.[4][5][6]

Additional factors such as endocrinological, emotional, genetic, using creams in the form of occlusive dressings, using drugs or the influence of profession and climatic factors are considered to be significant.[7]

Some studies shows that the role of diet in the etiopathogenesis of acne
A study was conducted among 166 acne patients in Jordan[10], where the role of various factors, including dietetic factors, potentially aggravating acne, according to patients' subjective assessment and beliefs, was examined. Maximum patients specified that acne was badly affected by nuts (89.2%), chocolate (89.4%), cakes and cookies (57.2%), high-fat products (53.0%), fried dishes (51.8%) and eggs (42.2%). However, the patients reported a deteriorated dermatological state on the basis of their own observations after eating butter or margarine (21.1%), milk, yoghurt and cheese (22.9%), cream (20.5%) and spices (10.8%). In addition, 1.8% of the patients observed aggravation of acne after eating grains and 12.1% of the patients considered drinking coffee or tea as a factor that deteriorates the skin state. The examined patients believed in the improvement of their dermatological state after eating a diet rich in vegetables and fruit.[8]

A study was also conducted in Saudi Arabia – it included 700 students of both sexes, living in different regions of Riyadh. The defendants were asked for their thoughts on acne. The study demonstrated that as many as 72.1% of

the persons taking part in the study believed in the role of diet in the aetiopathogenesis of acne.[9]

Skin Physiology

The skin is the largest vital organ in the human body. The main function of the skin is to act as a barrier, protecting the warm moist internal environment from the essentially hostile, dry and cool external environment in which we live. It is a communal credence that the skin acts as a barrier to the infiltration of external substances. In fact, it is permeable to numerous substances, including perfumes and dyes.

How acne developed

When pores in the skin become clogged than acne developed and this clogging due to the dead skin cells, bacteria, too much sebum produced by the body. Pimples and other types of lesion caused by inflammation and it is due to the clogged pores During puberty, the body produces more of a hormone called insulin-like growth factor 1 and it upsurge the production of sebum and deteriorate the symptoms of acne.[10]

Acne is a common skin disease characterized by red skin, rashes, blackheads, whiteheads and sometimes deep lesions. Acne typically occurs on face, back, chest, neck, and upper arms because this part contains sebaceous glands which are tiny oil producing glands that are influenced by hormones.

According to the severity acne classified into three groups

- **Mild acne:** non-inflammatory lesions, few inflammatory lesions or both.
- **Moderate acne:** more inflammatory lesions, occasional nodules — hard, painful lesions or both and mild scarring
- **Severe acne:** extensive inflammatory lesions, nodules, or both, and scarring, ongoing moderate acne that has not improved with treatment after 6 months, or any acne that causes serious psychological distress.[11]

Severe cases of acne can lead to disfiguring, permanent scarring of the skin and severe emotional distress that can lead to depression and withdrawal from social situations.[12]

Problem of acne is most commonly occur during the teenage and it typically affects adolescents due to increases in sex hormone levels during puberty, regardless of gender. Some people may experience it in their entire life.[13] Women also experience acne later in life related to hormonal fluctuations during pregnancy, premenopause and when using hormonal birth control.[14]

Causes of Acne

The causes of acne are complex and multifactorial.

- Genetic predisposition.
- Hormonal fluctuations- it can lead to excess sebum or oil production from the sebaceous glands, inflammation, follicular hyperkeratinization, and bacterial colonization can trigger acne.
- Follicular hyperkeratinization — the abnormal shedding of skin cells of the sebaceous glands and upper section of hair follicles near the opening of the pores is considered a main cause.[15]
- *Propionibacterium acnes* (*P. acnes*) is a bacterium that normally grows on skin.[16]
- Acne can also be caused by certain medications and occupational chemical exposure. However, these types of acne are different from acne vulgaris.[17]

Diet and Skin

Diet may play a role in the progress of acne. A person can prevent acne breakouts by consuming more omega-3 fatty acids, fewer dairy products, and fewer foods with a high glycaemic index. Acne is the most common skin condition. It is prevalent between the ages of 12 and 24. Acne can cause oily skin and several types of lesions including pimples. Symptoms of acne can be vary from mild to severe. The range of effective treatments includes prescription medications including gels and creams and Lifestyle changes .it can also help to diminish symptoms and prevent breakouts of acne. Some individuals have faith in that the diet plays a vital role in the prevention of acne. Results of a 2016 survey showed that 71 percent of participants thought that fried or greasy foods caused acne. Others thought that chocolate, dairy, and soda drinks were responsible.

In the medical community, there is widespread deliberation about the effect of the diet. While many experts once thought that the diet had no role in the development of acne, results of some recent studies suggest otherwise.[18]

Nutrients Can Affects Acne

- ✓ Ancient Hippocrates' statement should hold some truth when applied to acne is "the most efficacious current therapies for acne are retinoids". Oral administration of isotretinoin (13-cis-retinoic acid/Accutane) or topical application of its isomer and natural retinoid, tretinoin, are used as anti-acne therapies.[19][20] 13-cis-RA is a retinoid that could derive from the metabolism of Vitamin A and it is most efficient in sebum suppression.[21]
- ✓ Vitamin A plays an essential role in skin's health. Vitamin A deficiency causes abnormal visual adaptation to darkness, dry skin, dry hair and broken fingernails.[22]
- ✓ Vitamin A stored in the liver and it is also found in the skin particularly in the sebaceous glands, known to express retinoid receptors.[23][24]
- ✓ Most dermatologists are influenced by nutritional studies to recommend ingestion of isotretinoin with fatty foods
- ✓ The lipophilic vitamins A and D have an important impact on keratinocyte biology, which can also be

crucial to their proliferation in acne. The susceptibility of keratinocytes to the antiproliferative effects of vitamins A and D has been reported.[25]

- ✓ Vitamins A and D are the first group of nutrients that has been reported to exhibit properties of skin hormones. Due to this property, they control metabolism, activation, inactivation, and elimination of specialized skin cell.[26]
- ✓ Vitamin A and its natural metabolites have been approved for the topical and systemic treatment of mild, moderate and severe, recalcitrant acne, as well as photoaging, biologic skin aging, acute promyelocytic leukaemia and Kaposi's sarcoma.[26] Vitamin D's critical importance for the skin and consequently for the human body's endocrine system is demonstrated by the fact that the skin is both the site of synthesis of vitamin D active metabolites, as $1,25(OH)_2D_3$. In keratinocytes, $1,25(OH)_2D_3$ regulates growth and differentiation; for that reason, vitamin D analogues have been developed for the treatment of psoriasis which is characterized as an aggressive hyperproliferative skin disease.
- ✓ All the above examples are cited to reiterate the fact that these nutrients and their metabolites can influence skin hydration, hyperproliferation and metabolism.
- ✓ Vitamin E, the other major lipophilic vitamin, is delivered onto the skin via the activity of the sebaceous gland.[27][28]
- ✓ The two fatty acids that cannot be synthesized in human body such as linoleic and α-linolenic acid. These are important nutrients which is obtained by the diet and it is referred to as essential fatty acids. These two nutrients are precursors to the omega-6 and omega-3 fatty acid. These are involved in numerous important physiological processes including inflammation. Therefore, we could safely assume that absence of these important nutrients from our diet could have important implications for both acne and our overall health.[29]
- ✓ Numerous studies have revealed that clinical imbalances of specific essential fatty acids are associated with a variety of skin problems. The sign of fatty acid deficiency is dry, itchy and scaly. More relevant to this review is a publication which suggested that the sebum of acne patients is relatively deficient in linoleic acid.[30]
- ✓ A very recent nutritional study in two groups of women who were given flaxseed or borage oil for 12 weeks revealed that the daily ingestion of 2.2 g αLA and linoleic acid or 2.2 g linoleic and γ-linolenic acid respectively established some skin benefit. Skin annoyance, changes in skin reddening and blood flow were lessened in both groups, equated to the placebo group, providing evidence that skin properties can be modulated by intervention with dietary lipids.[31]

Bad foods

Certain foods can also raise IGF-1 levels. Symptom of acne and its outbreak can be reduced by avoiding following foods.

- Breads, especially white bread and bagels.
- Sweetened breakfast cereals such as corn flakes, puffed rice, and bran flakes, oatmeal and grits.
- Some fruits and vegetables, including melons, pineapples, pumpkins, and potatoes.
- Enriched pastas, such as rice-based pasta.
- Short grain white rice.
- Snack foods, such as pretzels, rice cakes, and popcorn and chocolates.
- Dairy products include milk dairy products promote insulin secretion and the production of hormones, such as IGF-1, which is known to be a major contributor to acne development
- Cheese, ice cream, and yogurt.[32]
- Western-type diet that is responsible for the development of acne. This diet is poor in essential unsaturated fatty acids, antioxidants and vitamins, and rich in carbohydrates with a high glycaemic index and trans fatty acids Due to the lack of essential unsaturated fatty acids, such as linoleic and linolenic acid, in the diet results in hyperkeratosis in the excretory ducts of the sebaceous glands and increases the trans epidermal water loss, which leads to the aggravation of acne.[33]

Good Food For Skin

Foods rich in omega-3 fatty acids, low glycaemic index and high protein good for the health of the skin include:

- Fish, such as mackerel, salmon, and sardines.
- Pastured eggs.
- Soybeans and soy products, such as tofu.
- Spinach and kale.
- Navy beans.
- Grass-fed beef.
- Nuts, such as walnuts and almonds.
- Flaxseed.
- Mustard seeds.
- Wild rice.[34]

A review of 14 studies that included 78,529 children and adults aged 7–30 found that the consumption of any dairy products, including cheese, milk and yogurt was associated with a greater risk of acne.[35]

Another review of 9 studies in 71,819 people showed that people who drank milk were 16% more likely to have acne than those who did not.[36]

Similarly, research indicates that consuming whey protein (milk protein) may be associated with acne.

One 2-month study in 30 people aged 18–45 observed that the use of whey protein was linked to the onset of acne.[37]

CONCLUSION

There are many treatment options are available to treat or to manage this diseased condition but they are chosen on the bases of patients tolerability as very few options are available to manage acne during pregnancy and lactation. After studying the different researches it is been observed that acne can be controlled or manage by simply modifying our dietary habits such as avoidance of high glycaemic food, dairy products and fatty food stuff. This area of study needs more research to prove this fact and to direct clinicians and persons involve in giving and taking acne treatment to provide most impactful and beneficial remedies with less harmful effects to the patient.

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