

Education-Family Physician

Acne Vulgaris and High Glycemic Load Diet

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A twenty-year-old Bahraini female complained of acne over the face and back, which exacerbated with high glycemic diet, such as potato chips and banana. The patient was advised to eat low glycemic diet and was treated with oral antibiotics, topical retinoid and topical bactericidal gel; her condition improved significantly.

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Acne vulgaris is a common chronic inflammatory disorder of the pilosebaceous gland caused by several factors. It is characterized by the formation of comedones, papules, pustules and in some cases cyst, nodules and scarring. The face was mainly affected (90%), followed by the back (60%) and the chest (15%)¹.

In the USA, acne affects more than 17 million; approximately 80%-90% of acne in adolescents would continue to up to 24 years of age². Acne vulgaris is common in developed Western countries because their diet is rich in dairy products, refined sugar and high glycemic load^{3,4}.

Risk factors are family history, stress, menstrual illness, dysmenorrhea, fatty acid, fried food, oily skin and genetic factors^{5,6}.

The aim of this presentation is to report a case of acne aggravated by a high glycemic load diet.

THE CASE

A twenty-year-old Bahraini female presented with a one-year history of pimples over the face and back which worsened over the previous month, it was associated with mild pain. It was aggravated with high glycemic load diet, such as potato chips and bananas; she was eating both excessively.

On examination, her skin was greasy, multiple comedones (black and white heads) on the cheeks, chin and forehead. She had erythematous papule on her upper back. All laboratory results were within normal range (CBC, RFT, LFT & hormonal profile).

The diagnosis of acne vulgaris due to high glycemic diet was made, and the patient was instructed to maintain a low glycemic diet and was prescribed oral doxycycline and topical gel (5% benzyl peroxide in the morning and adapalene gel at night). She showed significant improvement on subsequent follow-up appointment.

DISCUSSION

Acne is a multifactorial disease. There are four factors causing acne: comedogenic due to altered keratinization process, Propionibacterium acnes colonization of hair follicles, increased sebum production and inflammation around pilosebaceous unit⁷.

High glycemic diet is a possible cause of acne. Glycemic load diet increases the blood glucose which increases insulin level and insulin growth factor 1 (IGF-1) activity and decreases insulin growth factor binding protein 3 (IGFBP-3), which leads to an increase of IGF-1 compounding its direct activation⁸. IGF-1 is involved in the pathogenesis of acne, it stimulates keratinocytes and sebocytes proliferation and lipogenesis. Both insulin and IGF-1 increase gonadal and adrenal androgen synthesis from ovary and testes, decrease sex hormone binding globulin and activate androgen receptors and increase the bioavailability of androgen which results in increased sebum production and acne pathogenesis. IGFBP-3 inhibits IGF-1 from binding to its receptor and IGFBP-3 is a strong proapoptotic factor in keratinocytes and corneocytes⁸. Therefore, a high glycemic load diet plays a role in the pathogenesis of acne.

Smith et al found that a low glycemic load diet significantly improved the lesions by 51% and inflammatory acne by 45% compared to the control group. It also improved insulin sensitivity when compared with a high glycemic load diet⁹. In addition, a low glycemic load diet has significant effects on the endocrine system, which leads to a reduction of androgen level by decreasing the testosterone and DHEAS concentration⁹.

Kown et al showed that a low glycemic diet improves inflammatory acne by 70.9% and non-inflammatory acne lesions by 27.6%, reduces inflammation and reduce expression of sterol regulatory element binding protein 1 and IL8¹⁰.

A self-reported dietary questionnaire study revealed that high glycemic diet could aggravate acne development (chocolate 25.6%, French fries 26.2% and pizza 23.8%)¹¹.

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However, for successful treatment of acne, we have to understand the four stages of acne pathogenesis and focus our treatment regimens on the types of lesion and severity¹².

The first line of treatment should involve patient education, such as early dietary counseling to improve acne condition and to avoid aggravating diet such as saturated and hydrogenated fatty acids (fried foods and potato chips)^{1,13}. In addition, oral doxycycline for six weeks, 5% benzyl peroxides in the morning and different gel at night.

CONCLUSION

Acne vulgaris is a very common condition seen in secondary care setting. Dietary factors, especially high glycemic diet were positively associated with acne vulgaris. A reduction in high glycemic diets would result in the reduction in the level and types of acne lesions.

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Competing Interest: None. **Sponsorship:** None.

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