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Recommended Citation
Suda, Kate Meredith, "Associations Among Acne Vulgaris and Western Diet" (2018). Physician Assistant Scholarly Project Posters. 25.
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Associations among Acne Vulgaris and Western Diet

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Abstract

- Acne vulgaris is one of the most common dermatologic conditions, especially among the adolescent population.
- The pathogenesis of acne is largely multifactorial, with heredity and hormones playing a significant role in one's risk of developing the chronic inflammatory skin condition.
- High prevalence rates of acne in the adolescent population cannot be attributed solely to the influence of the Western diet (WD) which stimulates insulin-like growth factors (IGFs).
- The purpose of this scholarly project is to determine if there is an association between the presence of acne vulgaris and the consumption of WD, a physiological link between the high glycemic load and dairy products that compose the typical WD exists.
- This study examines the possible association among dietary products and their propensity to cause inflammatory acne.

Literature Review

Pathophysiology of Acne Vulgaris

- Increase in the production of adrenal androgens during adolescence typically occurs, leading to increased production of sebaceous glands.
- Increased sebum, along with the accumulation of epithelial cells and keratin, obstructs the hair follicle, causing swelling of the follicle and proliferation of keratinocytes.
- The availability of free IGF-1 decreases as acne progresses, leading to increased proliferative activity.
- The hyperinsulinemia that is linked with the Western diet can cause a shift in the endocrine pathways related to growth, and therefore cause increased insulin-like growth factor-binding protein-3 (IGFBP-3), which is associated with increased insulin resistance.

Associations between Hyperinsulinemia and Acne Vulgaris


Associations between Dairy-rich Diet and Acne Vulgaris

- An randomized controlled trial performed by Cerman, E. (2016) found that diets with high-glycemic loads were positively associated with acne vulgaris for participants with present acne. Glycemic index and glycemic load levels were found to be higher (p = 0.022) when compared to the control group (p = 0.001). There was a positive correlation between acne severity and glycemic index values (p = 0.04).

- Kaymak, E. et al. (2007) found that dietary glycemic index, glycemic load, and insulin levels did not play a role in the pathogenesis of acne in young patients.

- Smith, M., Braue, Makelainen, and Varigos (2007) used a randomized, investigator-masked, controlled trial to control for the effects of a low glycemic-load (LGL) diet with a conventional high glycemic-load diet. In the LGL group, ATP was increased, signifying an increased insulin resistance.

- A randomized controlled trial by Melnik (2018) found that intake of hyperglycemic carbohydrates and milk products both have the propensity to induce postprandial rises in insulin and glucose levels, which in turn, increase insulin resistance and the production of A2. Increased expression of A2 in the skin promotes cell growth and proliferation, which can lead to acne vulgaris.

References

- LaRosa et al. (2016) conducted a case-control study to investigate the possible association of acne vulgaris, diet, and acne vulgaris with the presence of acne vulgaris. They found that individuals with acne vulgaris had a higher glycemic load than individuals without acne vulgaris.

Applicability to Clinical Practice

- Not only can the presence of acne cause physical discomfort and scars but it also affects a patient's psychological and emotional well-being. It is important to consider both physical and psychological factors in the treatment of acne vulgaris.
- With acne vulgaris accounting for 35.0% of family medicine office visits in adolescent males and 66.9% of family medicine office visits in adolescent females, identifying and treating acne vulgaris is a critical task for physicians. Treatment of acne vulgaris, such as diet, is extremely applicable to primary care clinic providers.

In conclusion, the type of diet that is linked with Western diet can cause a number of diseases, such as hypertension, type II diabetes, dyslipidemia, coronary artery disease, obesity, and abnormal glucose tolerance.

Statement of the Problem

- Incidence rates of acne vulgaris have been substantially increasing in the United States over the last 25 years. Heredity and hormones alone cannot account for this increase. Possible associations among dietary glycemic load, dairy consumption, and acne vulgaris cannot be attributed solely to the influence of the Western diet, along with insulin resistance in relation to the pathogenesis of acne vulgaris need to be further investigated.

Research Questions

- Is there an association between the presence of acne vulgaris and the consumption of WD?
- Is there a physiologic link connecting high glycemic foods and dairy products and their propensity to cause inflammatory acne?