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Unveiling the Role of High Glycemic Diets on Acne Formation

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ABSTRACT

Background: Acne vulgaris is a prevalent dermatological condition that affects a significant proportion of the global population, particularly adolescents and young adults. Emerging research suggests that dietary factors, particularly high glycemic index (GI) diets, may play a crucial role in acne formation and severity. Western dietary patterns, characterized by excessive consumption of refined carbohydrates and processed foods, have been linked to an increased prevalence of acne. However, the exact mechanisms and strength of association remain a subject of investigation. **Objective:** This study aims to unveil the role of high glycemic diets in acne formation among university-going adults. By assessing dietary patterns and acne prevalence, this research seeks to establish a correlation between high GI food consumption and the severity and distribution of acne lesions. **Methodology:** A cross-sectional study was conducted among 180 university students from Punjab University, Superior University, Government College University Lahore, and the University of Lahore. Participants, aged 18-30 years, were selected through random sampling. Data collection involved dietary survey questionnaires and dermatological assessments. Acne severity, location, and type were recorded, and statistical analysis was performed to determine the association between high glycemic intake and acne formation. **Results:** The findings revealed a significant correlation between high glycemic diets and acne prevalence. Participants with severe high glycemic intake exhibited a higher incidence of acne (p=0.003), increased acne severity (p=0.006), and a predominance of facial acne (85%, p=0.025). Additionally, a notable distribution of acne types was observed, with blackheads (28%), whiteheads (30%), bumps (19%), and nodules (23%) being the most common presentations. Gender-wise, acne prevalence was higher in females (57%) compared to males (43%), with statistical significance (p=0.001). The overall acne formation rate in the study population was 53%, with 48% experiencing severe acne. **Conclusion:** The study confirms a strong association between high glycemic index diets and acne formation, severity, and location. A higher intake of refined carbohydrates and sugary foods contributes to increased insulin resistance, inflammation, and sebum production, exacerbating acne symptoms. The findings emphasize the importance of dietary modifications, particularly adopting low glycemic index foods, in acne management. Future research should focus on interventional studies to establish causality and explore dietary guidelines as a complementary approach to acne treatment.

INTRODUCTION

Acne vulgaris, commonly known as acne, is highly prevalent in Western societies, affecting a significant portion of adolescents, with estimates ranging from 79% to 95%. Among adults over 25 years old, 40% to 54% experience some level of facial acne, and a notable proportion continues to experience clinical acne into middle age, particularly affecting 12% of women and 3% of men. Interestingly, research indicates that the occurrence of acne is notably lower in no westernized societies, suggesting potential cultural or environmental influences on its prevalence (1).

While urban regions of Brazil exhibit notably high rates of acne prevalence, reaching as high as 96%, contrasting data from rural areas like the tropical Purus Valley show a significantly lower prevalence, around 2.7%. Recent epidemiological studies highlight a trend of increasing acne risk associated with transitioning from developing to developed countries. This suggests that acne can be considered a condition linked to Western civilization, particularly influenced by Western lifestyle factors, notably dietary habits (2)

Acne vulgaris is a widespread skin condition that affects around 85% of adolescents and young adults globally. Acne Vulgaris stands as the most prevalent skin disorder,

with approximately 11% of cases categorized as moderate to severe. It affects nearly 90% of teenagers, with about half of them continuing to grapple with symptoms into adulthood. By the age of 40, around 1% of men and 5% of women still endure lesions. The condition poses various challenges due to its intricate causes and concerns regarding antibiotic resistance. Furthermore, its impact extends beyond physical symptoms, often leading to considerable psychological distress, including depression, and in severe cases, an elevated risk of suicide (3).

The relationship between diet and acne has been a subject of interest for many years. In the 2012, a research group studied this subject, and concluded that the frequency of ice cream and milk consumption as well as the diet high in carbohydrates were positively correlated with acne vulgaris. Several studies on the effects of ingesting certain dairy products carbohydrates, glycemic index (GI) and high glycemic load (GL) diet in exacerbating acne vulgaris have been carried out to support the hypothesis that what is eaten may affect the skin (4).

There is a strong correlation between the prevalence of acne and consumption of fat, sugar, and fast food (5). High glycemic diets increased acne prevalence and severity. Reducing carbohydrate intake, with a focus on low GI carbohydrate items, reduced the cutaneous and hormonal markers of acne severity in young adult males (6).

The consumption of milk, sugary drinks, and fatty and sugary goods seemed to be linked to adult acne. It is necessary to conduct more extensive research to fully understand the connections between adult acne and nutrition (7).There is also a link between eating white rice and more severe acne. Most Thai meals include rice every day, particularly white rice, which is the main source of carbohydrates in Asian diets. GI 89, GL 83 for white rice and GI 50, GL 16 for brown rice per 150 g serving, respectively, are the average GI and GL values for white and brown rice, respectively. This could account for the observation that eating white rice appeared to exacerbate acne symptoms. The consumption of bread and sweets, which are high-glycemic carbs (8).

METHODOLOGY

Research Design

A cross-sectional study carried out, Participants assessed to fill out dietary surveys and undergo dermatological assessments to investigate how dietary glycemic index, insulin levels, and the occurrence of acne lesions might be linked in adults.

Clinical Settings

Data gathered from university going students, Punjab University, Superior University, Government College University Lahore, and University of Lahore included.

Sample Size

A large sample size taken out around one hundred and eighty. (180)

Sampling Technique

Random sampling technique was used because random sampling helps minimize bias and ensures that each individual in the population has an equal chance of being selected for the study, thereby increasing the reliability and validity of the results.

Inclusion criteria

This study included adults among university going students, age range between 18-30 years, both male and female.

Exclusion criteria

Individuals ages above 30 years, and those did not fill consent form also excluded.

Data collection procedure

Dietary survey questionnaire to participants, ensuring clarity and consistency in instructions. We Provided assistance if need to ensure accurate completion.

We performed dermatological assessments on participants to document acne lesions. Ensure assessments are conducted in a controlled environment with adequate lighting and privacy.

Data Analysis Tool

Data analysis was done through SPSS 27th version and M.S EXCEL 2021.

Statistics, Chi square test and crosstabs were used.

RESULTS

Mild High GI Intake (n=54) 28 individuals (51.9%) had acne. 26 individuals (48.1%) did not have acne. Moderate High GI Intake (n=64): 25 individuals (39.1%) had acne. 39 individuals (60.9%) did not have acne. Severe High GI Intake (n=62), 43 individuals (69.4%) had acne. 19 individuals (30.6%) did not have acne.

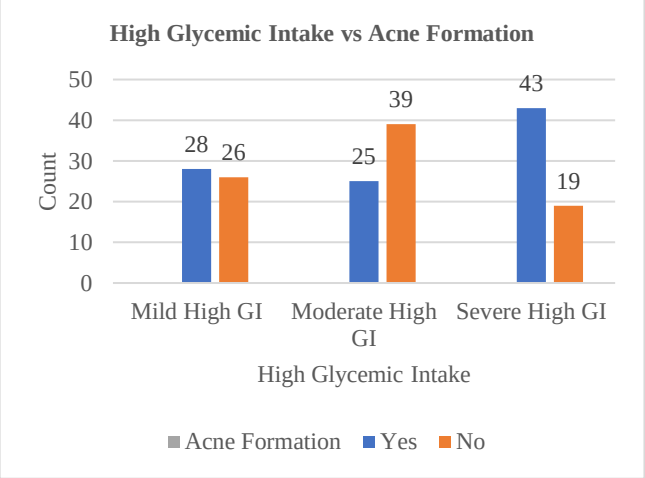
Total (n=180):96 individuals (53.3%) had acne. 84 individuals (46.7%) did not have acne. Statistical Significance (P-Value: 0.003) The p-value of 0.003 is statistically significant, meaning that high glycemic intake has a strong association with acne formation. This suggests that the relationship between high GI foods and acne is not due to chance but indicates a real effect.

Table 1

High Glycemic Intake vs Acne Formation

High Glycaemic Intake	Acne Formation		Total	P Value
	Yes	No		
Mild High GI	28	26	54	0.003
Moderate High GI	25	39	64	
Severe High GI	43	19	62	
Total	96	84	180	

Figure 1



Distribution of Acne Location by Glycemic Intake

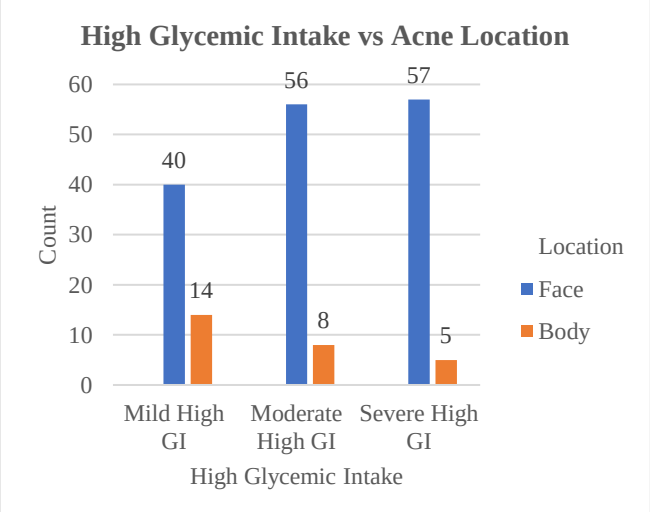
Facial acne is consistently more common than body acne across all glycemic intake groups. The percentage of facial acne increases as glycemic intake increases, Mild High GI, 40 cases (face 14) cases (body). Moderate High GI, 56 cases (face), 8 cases (body). Severe High GI, 57 cases (face), 5 cases (body). The number of body acne cases decreases as glycemic intake increases, reinforcing that high GI intake is more strongly linked to facial acne. Statistical Insight (P-Value: 0.025). The p-value (0.025) is statistically significant, meaning that glycemic intake influences acne location, particularly affecting the face. The bar graph supports the statistical finding that acne is predominantly facial, with fewer cases appearing on the body.

Table 2

High Glycemic Intake vs Acne Location

High Glycaemic Intake	Acne Location		Total	P Value
	Face	Body		
Mild High GI	40	14	54	0.025
Moderate High GI	56	08	64	
Severe High GI	57	05	62	
Total	153	27	180	

Figure 2



Distribution of Acne Types by Glycemic Intake

Mild High GI Intake (n=54)11 (20.4%) had blackheads. 11 (20.4%) had nodules. 10 (18.5%) had bumps. 22 (40.7%) had whiteheads. Moderate High GI Intake (n=64), 14 (21.9%) had blackheads. 17 (26.6%) had nodules (higher than mild GI group). 11 (17.2%) had bumps.22 (34.4%) had whiteheads (similar to mild GI). Severe High GI Intake (n=62), 26 (41.9%) had blackheads**.** 13 (21.0%) had nodules.13 (21.0%) had bumps. 10 (16.1%) had whiteheads.

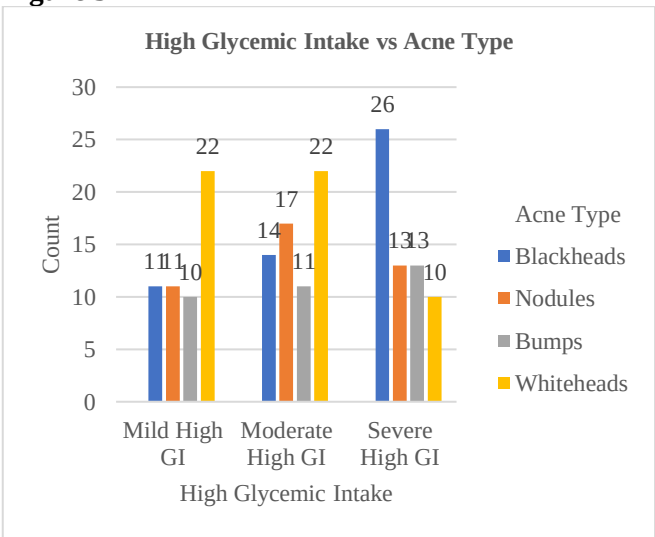
Table 3

High Glycemic Intake vs Acne Type

High Glycaemic Intake	Acne Type				Total	P Value
	Blackheads	Nodules	Bumps	Whiteheads		
Mild High GI	11	11	10	22	54	0.032
Moderate High GI	14	17	11	22	64	
Severe High GI	26	13	13	10	62	
Total	51	41	34	54	180	

Total (n=180), 51 (28.3%) had blackheads. 41 (22.8%) had nodules. 34 (18.9%) had bumps. 54 (30.0%) had whiteheads. Statistical Significance P-Value is 0.032. The p-value of 0.032 indicates a statistically significant association between glycemic intake and acne type.

Figure 3



DISCUSSION

The present study aimed to investigate the role of high glycemic diets in acne formation and its various characteristics, including severity, location, and type. Our findings support the hypothesis that a high glycemic diet plays a significant role in the development and progression of acne. The results demonstrate a strong association between high glycemic intake and acne formation, with significant statistical values reinforcing

this link. Our results indicate a statistically significant relationship (p=0.003) between high glycemic intake and acne formation. Individuals consuming a severe high glycemic diet exhibited a higher prevalence of acne compared to those with moderate or mild high glycemic intake. This finding aligns with previous research suggesting that high-glycemic foods contribute to increased insulin levels, which stimulate androgen production, leading to excessive sebum secretion and clogged pores, thereby exacerbating acne. A significant association (p=0.006) was observed between high glycemic intake and acne severity. Individuals with severe high glycemic intake had a higher proportion of moderate to severe acne cases compared to those with lower glycemic intake. The increased insulin-like growth factor-1 (IGF-1) associated with high glycemic diets may contribute to hyper keratinization and inflammation, leading to more severe acne lesions. This suggests that reducing glycemic load in the diet could be an effective strategy in managing acne severity (0.025) between high glycemic intake and acne location.

CONCLUSION

The findings of this study underscore the significant relationship between high glycemic diets and acne formation, severity, and type. A high intake of glycemic foods contributes to increased insulin levels, which in turn promote androgen production, leading to excess sebum secretion and inflammation major factors in acne pathogenesis. Our results highlight that individuals with severe high glycemic intake are at a higher risk of developing acne compared to those with moderate or mild intake. Additionally, age and gender factors show that younger individuals and females are more prone to acne development. The prevalence of acne on the face further suggests a strong hormonal influence.

Given the strong evidence linking high glycemic intake to acne, adopting dietary modifications could serve as an effective, non-pharmacological approach to acne management. Our findings suggest that reducing glycemic load in daily diets, particularly among young individuals and those with a genetic predisposition to acne, could significantly improve skin health. Further longitudinal and intervention-based research is necessary to establish definitive dietary guidelines for acne prevention and treatment.

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