Section: Dermatology

Original Research Article

THE ASSOCIATION BETWEEN DIET AND ACNE SEVERITY: A PROSPECTIVE OBSERVATIONAL STUDY

M Nagaswetha[1], B Shankar Kumar[2], C. Sudharani[3], G. Narasimha Rao Netha[4]

[1]Assistant Professor, Department of Dermatology, Venereology and Leprosy, Gandhi Medical College, Secunderabad, Telangana, India
[2]Assistant Professor, Department of Dermatology, Venereology and Leprosy, Gandhi Medical College, Secunderabad, Telangana, India
[3]Professor, Department of Dermatology, Venereology and Leprosy, Gandhi Medical College, Secunderabad, Telangana, India
[4]Professor and Head, Department of Dermatology, Venereology and Leprosy, Gandhi Medical College, Secunderabad, Telangana, India.

Received : 09/04/2023
Received in revised form : 18/06/2023
Accepted : 10/07/2023

Keywords:
Acne vulgaris, diet, dietary fiber, glycemic index, fatty acid profile, acne severity.

Corresponding Author:
Dr. M Nagaswetha,
Email: mnswethu@gmail.com

DOI: 10.47009/jamp.2023.5.4.428

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (4); 2127-2130

Abstract

Background: Acne vulgaris is a common dermatological condition affecting adolescents and young adults, with diet hypothesized to play a role in its pathogenesis. This prospective observational study aimed to examine the association between dietary factors and acne severity among a cohort of 100 participants aged 18 to 30 years over a six-month period. **Material and Methods:** Participants' dietary intake, including total caloric intake, macronutrient distribution, dietary fiber intake, glycemic index, and fatty acid profile, was assessed using a validated food frequency questionnaire. Acne severity was evaluated using a standardized acne grading scale at baseline and after six months. Correlation and regression analyses were conducted to determine the relationship between dietary factors and acne severity. **Results:** Higher dietary fiber intake and diets with lower glycemic index were significantly associated with reduced acne severity ($p < 0.01$ and $p < 0.05$, respectively). Conversely, saturated fat intake showed a weak positive correlation with acne severity ($p < 0.05$). Multiple regression analysis identified dietary fiber intake as the strongest predictor of improved acne severity ($\beta = -0.25$, $p < 0.001$), after controlling for age, gender, and total caloric intake. **Conclusion:** This study provides evidence supporting the role of dietary factors, particularly dietary fiber and glycemic index, in influencing acne severity among young adults. These findings suggest that dietary modifications, such as increasing dietary fiber intake and opting for low-glycemic-index foods, may serve as adjunctive measures in the management of acne vulgaris.

INTRODUCTION

Acne vulgaris is a prevalent dermatological condition characterized by the formation of comedones, papules, pustules, and nodules on the skin, primarily affecting adolescents and young adults.[1] Despite its widespread occurrence, the etiology of acne remains multifactorial, with genetic predisposition, hormonal influences, and environmental factors implicated in its pathogenesis.[2,3] In recent years, increasing attention has been directed towards the role of diet in acne development and severity.[4]

Dietary factors have long been speculated to contribute to acne pathophysiology, with certain foods thought to exacerbate or alleviate acne symptoms.[5] However, the evidence regarding the association between diet and acne remains inconclusive, with conflicting findings reported in the literature. While some studies suggest a link between high-glycemic-index diets, dairy consumption, and acne exacerbation, others have failed to establish a definitive relationship.[6,7]

Given the potential impact of dietary habits on acne severity, there is a growing interest in elucidating the role of specific dietary components in acne pathogenesis. Understanding the influence of diet on acne not only provides insights into disease mechanisms but also offers opportunities for non-pharmacological interventions to complement existing acne management strategies.[8]

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Therefore, this prospective observational study was undertaken to investigate the association between dietary factors and acne severity among a cohort of young adults. By assessing participants' dietary intake and acne status over a six-month period, this study aims to provide valuable insights into the role of diet in acne development and progression. The findings of this study may inform dietary recommendations and adjunctive therapeutic approaches for individuals with acne vulgaris, thereby improving disease management and patient outcomes.

MATERIALS AND METHODS

Study Design: This study employed a prospective observational design to investigate the association between dietary factors and acne severity among young adults.

Study Setting: The study was conducted at Gandhi Medical College, situated in Secunderabad, India. The outpatient pediatric dermatology clinics at the medical college served as the primary site for participant recruitment, intervention administration, and follow-up assessments.

Study Period: Data collection for the study commenced in January 2022 and concluded in December 2022, spanning a total duration of 12 months.

Participant Selection: The study recruited participants aged between 18 and 30 years who presented to the outpatient pediatric dermatology clinics with a diagnosis of acne vulgaris. Participants were enrolled based on the following inclusion criteria[9].

Inclusion Criteria

Age between 18 and 30 years

Diagnosis of acne vulgaris confirmed by a qualified dermatologist

Willingness to participate in the study and provide informed consent

Exclusion Criteria

Presence of other dermatological conditions complicating acne assessment

History of chronic systemic diseases affecting dietary habits

Pregnancy or lactation

Use of systemic medications known to affect acne severity

Data Collection:

Baseline Assessment:

Demographic information, including age and gender, was recorded for each participant.

Baseline acne severity was evaluated using a standardized acne grading scale.

Participants completed a validated food frequency questionnaire (FFQ) to assess their dietary habits and intake of specific nutrients.

Follow-up Assessments:

Participants were followed up at regular intervals throughout the study period.

Acne severity was assessed using the same standardized grading scale at each follow-up visit.

Dietary intake was reassessed using the FFQ to monitor any changes in dietary habits over time.

Statistical Analysis: Descriptive statistics were used to summarize participant characteristics and dietary intake. Correlation analysis was conducted to assess the relationship between dietary factors and acne severity. Additionally, multiple regression analysis was performed to identify predictors of acne severity while controlling for potential confounding variables such as age, gender, and total caloric intake.

Ethical Considerations: The study protocol was reviewed and approved by the Institutional Ethics Committee of Gandhi Medical College. Informed consent was obtained from all participants prior to enrollment, and confidentiality of participant data was strictly maintained throughout the study.

RESULTS

A prospective observational study was conducted to investigate the association between diet and acne severity among a sample of 100 participants. The participants were aged between 18 and 30 years, with an equal distribution of males and females. The study period spanned six months, during which participants' dietary habits and acne severity were assessed at regular intervals.

Baseline Characteristics:

The mean age of the participants was 24.5 years (SD = 2.3), with a range of 18 to 30 years.

Among the participants, 50 were male and 50 were female.

Dietary Intake:

Participants' dietary intake was assessed using a validated food frequency questionnaire (FFQ), which captured information on various food groups and nutrients. The following parameters were evaluated:

Total Caloric Intake: The mean total caloric intake was 2200 kcal/day (SD = 300).

Macronutrient Distribution:

Carbohydrates: Mean intake of 55% of total calories (SD = 5%).

Protein: Mean intake of 20% of total calories (SD = 3%).

Fat: Mean intake of 25% of total calories (SD = 4%).

Dietary Fiber Intake: Mean intake of dietary fiber was 25 grams/day (SD = 5).

Glycemic Index (GI): The mean GI of participants' diets was 60 (SD = 10).

Fatty Acid Profile:

Saturated Fat: Mean intake of 10% of total calories (SD = 2%).

Monounsaturated Fat: Mean intake of 8% of total calories (SD = 1.5%).

Polyunsaturated Fat: Mean intake of 7% of total calories (SD = 1%).

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Acne Severity:
Acne severity was assessed using a validated acne grading scale, which categorized acne lesions into the following grades: mild, moderate, and severe. The following parameters were evaluated:

Prevalence of Acne:
At baseline, 60% of participants had mild acne, 30% had moderate acne, and 10% had severe acne.
Over the six-month study period, there was a significant decrease in the prevalence of acne lesions.

Change in Acne Severity:
Mild Acne: Decreased from 60% to 40%.
Moderate Acne: Decreased from 30% to 20%.
Severe Acne: Decreased from 10% to 5%.
Association Between Diet and Acne Severity:

Correlation Analysis:
Total caloric intake did not show a significant correlation with acne severity ($p > 0.05$).
Higher intake of dietary fiber was associated with a significant reduction in acne severity ($p < 0.01$).
Diets with a lower glycemic index were correlated with decreased acne severity ($p < 0.05$).
Saturated fat intake showed a weak positive correlation with acne severity ($p < 0.05$).

Regression Analysis:
Multiple regression analysis revealed that dietary fiber intake was the strongest predictor of improved acne severity ($\beta = -0.25$, $p < 0.001$), controlling for age, gender, and total caloric intake.

Table 1: Study Population Characteristics

Characteristic	Treatment Group	Control Group
Number of Participants	50	50
Mean Age (years)	8	8
Age Range (years)	3-16	3-16
Gender Distribution (%)	52% Male; 48% Female	52% Male; 48% Female
Baseline EASI Score (mean)	22.5	23

Table 2: Efficacy Outcomes

Outcome Measure	Treatment Group Change	Control Group Change	P-value
SCORAD Index Reduction (%)	75% (from 50 to 12.5)	20% (from 50 to 40)	<0.001
EASI Score Reduction (%)	70% (from 22.5 to 6.75)	15% (from 23 to 19.55)	<0.001
DLQI Improvement (%)	60% (from 10 to 4)	10% (from 10 to 9)	<0.001

Table 3: Side Effects

Side Effect	Treatment Group (%)	Control Group (%)
Mild Burning Sensation	10%	8%
Transient Itching	5%	4%
Localized Erythema	2%	0%
Serious Adverse Events	0%	0%

Table 4: Compliance and Satisfaction

Measure	Treatment Group (%)	Control Group (%)
Compliance Rate	>95%	>95%
Satisfaction Rate	85%	30%

DISCUSSION

The present study aimed to investigate the association between dietary factors and acne severity among young adults attending outpatient pediatric dermatology clinics at Gandhi Medical College, Secunderabad, India. The findings shed light on the potential role of diet in acne pathogenesis and have implications for acne management strategies.

Association Between Dietary Factors and Acne Severity: Our study revealed several noteworthy associations between dietary factors and acne severity. Higher dietary fiber intake was significantly correlated with reduced acne severity, while diets with lower glycemic index were also associated with decreased acne severity. These findings are consistent with previous research suggesting that dietary components, particularly fiber-rich foods and low-glycemic-index diets, may exert beneficial effects on acne.[10] The observed weak positive correlation between saturated fat intake and acne severity warrants further investigation, as it contradicts some previous findings in the literature.[11]

Implications for Acne Management: The identification of dietary factors influencing acne severity has important implications for acne management. Dietary modifications, such as increasing dietary fiber intake and opting for low-glycemic-index foods, may serve as adjunctive measures in acne treatment regimens. Healthcare professionals can integrate dietary counseling into acne management protocols to optimize treatment outcomes and improve patient satisfaction.[12] Furthermore, raising awareness among individuals with acne about the potential impact of diet on their condition empowers them to make informed lifestyle choices that may alleviate symptoms and enhance overall well-being.[13]

Limitations and Future Directions: Despite the valuable insights gained from this study, several

ISSN (O): 2687-5365; ISSN (P): 2753-6556

limitations warrant consideration. The observational nature of the study precludes establishment of causality, and the possibility of confounding variables influencing the observed associations cannot be ruled out. Additionally, dietary intake was assessed using self-reported measures, which are subject to recall bias and may not accurately reflect actual dietary habits. Future research should incorporate objective dietary assessment methods and longitudinal study designs to validate the findings and elucidate the underlying mechanisms linking diet and acne pathophysiology.

CONCLUSION

Our study contributes to the growing body of evidence implicating dietary factors in acne severity among young adults. The findings underscore the importance of dietary counseling and lifestyle interventions in acne management, complementing traditional pharmacological approaches. By addressing modifiable risk factors such as diet, healthcare providers can adopt a holistic approach to acne care, optimizing patient outcomes and promoting long-term skin health. Further research is warranted to explore the mechanistic basis of the observed associations and develop targeted interventions for acne prevention and treatment.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556