Assessment of Acne Severity in Adult Female Acne Patients in Relation to BMI

Reham Maher Abdel Gaber[*1], Emad Abdelraheem Taha[1], Randa Ahmed El Zohne[***2], *Diana Gamal-Esmat Fouad Botros*[****3], Radwa M. Bakr[*****1]**

[1] Department of Dermatology, Venereology and Andrology, Faculty of Medicine, Assiut University, Egypt.

[2] Clinical Pathology Department, Faculty of Medicine, Assiut University, Egypt.

[3] Dermatology, Venereology and Andrology Department, Asyut General Hospital, Ministry of Health, Asyut, Egypt. e-mail: dianaesmat89@gmail.com

Abstract

Background: Acne stands as one of the most prevalent disorders in dermatology. Acne and weight gain are thought to be clinical indicators of h yperandrogenism, and it appears that obesity is linked to increased sensitivity to androgenic hormones and more severe acne. To better manage acne sufferers, this research may help uncover any connections between the severity of acne and Body Mass Index (BMI) in adult female patients.

Objectives: To determine the relation between BMI and acne severity in adult female acne patients.

Methods: This is a one-year case-control study. Informed written consent was taken from 103 females who attended the dermatology, venereology, and andrology outpatient clinic at Assiut University in Assiut, Egypt, between the 1st of April, 2022, and the 31st of March, 2023. The case group comprised 53 adult females with acne, whereas 50 age-matched females without acne comprised the control group. The Global Acne Grading System (GAGS) was used to determine the severity of acne.

Results: The BMIs of both study groups were comparable. According to the GAGS scale, 19 cases (35.8%) had mild, 18 cases (34.0%) had moderate, 14 cases (26.4%) had severe, and two cases (3.8%) had very severe acne vulgaries. BMI and acne severity showed a significant positive correlation ($r=0.542$, $p<0.001$).

Conclusions: This study showed that acne severity and BMI are related. Thus, BMI may be related to acne pathogenesis and severity in adult female patients.

Keywords: Acne vulgaris, Females, Severity, Body mass index.

Background:

The number of adult women who visit dermatological clinics with acne vulgaris has been rising recently and gaining more concern, as approximately 40% of adult females were affected (1).

Adult female acne (AFA) is described as acne that appears on women older than 25 years and may have existed intermittently or constantly throughout adolescence or may have appeared for the first time. The pathophysiology of AFA, characterized by chronic evolution and requires maintenance treatment, often for years, is thought to be influenced by hormonal and genetic variables (2, 3).

It is unclear which risk factors cause AFA. Age, diet, BMI, cosmetic use, premenstrual flare-ups, hyperandrogenism, and familial history of acne are some of the suggested risk factors (4).

Some authors categorize AFA into two groups: those between the ages of 25 and 44 and those over 45 approaching menopause. However, the specific characteristics of each group still require proper characterization (4).

Research on acne in teenagers and young adults has shown that having a high BMI

affects acne. These studies' findings indicate that having a low BMI can help to avoid developing acne vulgaris (5, 6). As opposed to that, among adult women, BMI seems to have a mixed effect on acne (1, 7, 8). Research from Turkey and Italy has found no correlation between adult women's BMI and the frequency or severity of acne (1, 7). However, these studies did not specifically focus on BMI and adult acne, which may be the reason for the study's findings. In contrast, Lu and Hsu (2015) from Taiwan found a positive correlation between BMI and the severity of acne (8).

Acne severity can be assessed with the Global Acne Severity Scale (GAGS), a quick, easy, and accurate procedure that does not need any special tools and is reasonably priced. It has little interpersonal and personal distinctions (9), and Doshi and his coworkers employed it for the first time in the United States in 1997 (10).

Despite its high occurrence, limited studies are available about adult female acne (AFA), and its risk factors are still unclear. There is a shortage of research on how BMI affects adult women with acne. The goal of the current study was to describe the association between BMI and AFA, as well as the association between BMI and AFA severity.

Methods

This is a one-year case-control study conducted from the 1st of April 2022 to the end of March 2023. 53 AFA and 50 healthy age-matched controls were enrolled in the Assiut University Dermatology female clinic study. Under-25-year-old women with acne were not permitted to take part in the study.

Through GAGS, acne severity was evaluated. A factor based on surface area (forehead=2, right cheek=2, left cheek=2, nose=1, chin=1, chest and upper back=3) and density of pilosebaceous units is taken into account for each of the six places on the face and chest/upper back. A score would be given according to the type of lesions present in each region (No lesion=0, One comedone=1, One pustule=3, One nodule=4). The aggregate of the scores would then be multiplied by the factors (Local score=Factor*Grade from 0 to 4), and the sum of the result would be the global score (0-52). The severity is divided into four categories: mild (1–18), moderate (19–30), severe (3–38), and very severe (if the score is greater than 38) (10).

Each patient's BMI (kg/m2) was determined using her weight and height. We used the World Health Organization's (1995) suggested BMI reference range (underweight: 18.5 kg/m^2; normal: 18.5-24.9 kg/m^2; overweight: 25-29.9 kg/m^2; obese: >30 kg/m^2) (11).

The study followed the regulations of the Ethical Committee of Assiut University (IRB no: 17100530). All participants in the current study provided their written consent after receiving complete information.

Statistical Analysis

The data were analyzed using SPSS (Statistical Package for the Social Science, version 20). The mean, SD, or median (range) are statistical terms used to represent qualitative data, and the number (%) is used to characterize qualitative data statistically. A student t-test was used to compare parametric data. The Pearson correlation test was used to determine the correlation between distinct variables. P-value set to 0.05 for significance.

Results

Table 1 provides an overview of the demographic information of the participants in the study. With no discernible difference, the two study groups were similar in age. Additionally, the two study groups have no significant difference in BMI. According to the GAGs, 19 cases (35.8%) had mild, 18 cases (34.0%) had moderate, 14 cases (26.4%) had severe, and two cases (3.8%) had very severe acne vulgaries.

Table 1 Baseline data between both studied groups

Variable name	Cases (n=53)		Controls (n=50)		P value
Age (years)					
25 < 30	29	(54.7)	23	(46.0)	
30 < 40	19	(35.8)	18	(36.0)	
40 - 50	5	(9.4)	9	(18.0)	
Mean ± SD		31.04 ± 5.63		31.96 ± 6.06	0.454*
BMI (kg/m2)					
Normal	17	(32.1)	12	(24.0)	
Overweight	19	(35.8)	17	(34.0)	
Obese	17	(32.1)	21	(42.0)	
Mean ± SD		27.59 ± 5.41		29.09 ± 5.17	0.155*
Disease severity, n (%)					
Mild	19	(35.8)			
Moderate	18	(34.0)			
Severe	14	(26.4)			
Very severe	2	(3.8)			
Median GAGS (range)		23 (7 – 44)			

GAGS: Global Acne Grading System. *An independent t-test was used to compare differences in means between groups.

A significant positive correlation was observed between acne severity as assessed by GAGs and BMI of the studied AFA (r=0.542, p<0.001) **(Figure 1)**.

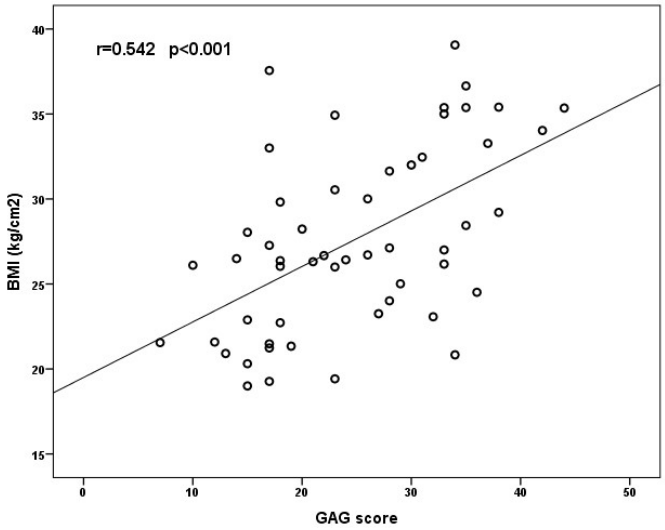

Figure 1 Correlation between BMI and GAG score

Discussion

Acne was found to be strongly associated with BMI in school-age children (ages 6 to 11) (12), adolescents (ages 14 to 17) (13), and young adults (18–25 years) (14). In adult women, the association between BMI and acne appeared equivocal (15-17). However, compared to non-obese women, obese women in Taiwan had a reduced incidence of acne (16).

The present study aimed to determine the relationship between patients' BMI and acne vulgaris in AFA. Consistent with the previous publication, we did not observe a relation between BMI and the risk of developing acne, as we observed that BMI was comparable between studied cases and healthy matched controls. Thus, BMI was not shown to be a risk factor for developing AFA. A similar finding was reported by the recent study of Podder et al. (18) on Asian Indian females, as the author reported that both studied cases and matched controls were comparable for their BMI and waist circumference. In addition, this finding is consistent with the study of Balta et al. (19). On the other hand, a Del Prete et al. (20) study found that acne patients had higher BMI and waist circumferences than the controls. This difference could be attributed to the difference in the inclusion criteria, as Del Prete *et al.* (20) only focused on adult male patients with acne, while the current study focused only on AFA.

BMI is recognized to be a risk factor for acne in teenagers (5, 13). The limited studies on BMI and AFA concur with our findings that BMI is not a risk factor for AFA (1, 7).

The influence of BMI differs between adults and adolescents with acne, probably due to additional elements, such as stress, hormones, and diet (8). The earlier papers' definitions and descriptions of acne varied from one study to the next, in addition to the different patients' ages and the grading system used for assessing acne severity.

In the present study, we used GAGS to evaluate the severity of acne because it is simple to use. The median GAG score among our studied cases was 23 and ranged from (7 to 44) whereas 35.8% had mild acne, 34.0% showed moderate, 26.4% had severe acne, and two cases (3.8%) had very severe degrees of acne. This high acne severity among our studied cases is unsurprising as the current study was conducted at one of the major tertiary healthcare hospitals, Assiut University Hospital.

Barrea et al. (23) found a similar conclusion, stating that the clinical severity of acne as determined by GAGS was 22.08 ± 9.12, with 33.3% having mild acne, 51% having moderate acne, and 15.7% having severe acne.

Additionally, in the present study, we observed that among AFS studied cases, acne severity significantly correlates with their BMI. In line with this finding, Lu and Hsu (2015) discovered that BMI predicted severe acne in Taiwan. Additionally, a Turkish study reported that BMI and acne severity were positively correlated (25).

On the other hand, Ekiz et al. (2015) (7) in Turkey and Anaba & Oaku, 2021 (26) in Nigeria were unable to show a relation between BMI and acne severity. Also, the study by Podder et al. (18) did not observe any association between BMI and acne severity.

Limitations

Our study's primary weaknesses are its single-center design and limited sample size. To confirm the impact of BMI on the development of acne among AFA, we suggest conducting additional multicenter studies with a bigger sample size.

Conclusions

Body mass index was shown to be a risk factor for severe acne among adult female acne patients.

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