Prevalence and Sociodemographic Factors of Acne Vulgaris in Bangladeshi Adolescents and Adults – A Retrospective Study

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Abstract

Introduction: Acne vulgaris is classified according to the severity of skin lesions and the types of post-healing scars resulting from these lesions. While numerous epidemiological studies have investigated the risk factors associated with the presentation and severity of acne, there is a lack of research focused on acne scarring. ***Objective:*** *To investigate the prevalence and sociodemographic factors of acne vulgaris among Bangladeshi people.* ***Methods:*** *A total of 150 patients visited the Department of Skin & VD. Community-Based Medical College Bangladesh, Winnerpar, Mymensingh with symptoms of acne vulgaris.* ***Results:*** *Parental acne showed a significant association with both the presence of acne and the severity of moderate to severe acne. In addition, sibling acne was also significantly associated with these factors. Gender and age influenced acne severity and scarring but did not impact the initial presentation of acne. An underweight Body Mass Index (BMI) appeared to have a protective effect against acne presentation, whereas atopic diseases—such as asthma, allergic rhinitis, and eczema—were identified as predisposing factors. Among the lifestyle factors evaluated, computer and TV usage had a significant correlation with the presentation of acne, while alcohol consumption was significantly linked to acne severity. Interestingly, frequent consumption of milk was associated with a protective effect against moderate to severe acne.* ***Conclusion:*** *A positive familial history is a significant predisposing factor in determining the presentation, severity, and scarring of acne. Demographic factors such as gender and age, along with a sedentary lifestyle influence acne presentation.*

Keywords: *Acne vulgaris, acne severity, acne scarring, epidemiology, risk factors*

1. INTRODUCTION

Acne vulgaris, commonly known as acne, is an inflammatory skin condition that is well-characterized clinically [1]. The pilosebaceous unit, which consists of the hair follicle and sebaceous gland, is the primary site for acne development. The sebaceous gland produces

and secretes sebum onto the skin surface through the pore of the hair follicle [2]. Acne lesions occur when the pore of the pilosebaceous unit becomes blocked or inflamed. Acne lesions can be categorized into several types: comedones, papules, pustules, nodules, and cysts, based on their size and appearance. Comedones are often referred to as "non-inflammatory lesions," while papules, pustules, nodules, and cysts are collectively known as "inflammatory lesions" due to their red and swollen appearance. The severity of acne can be broadly classified into three categories: mild, moderate, and severe. Milder acne typically presents with non-inflammatory lesions, while more severe cases display both inflammatory and non-inflammatory lesions [3]. During the healing process, damaged skin may develop scars [4]. There are two primary types of scars, depending on whether there is a net loss or gain of collagen: atrophic scars (the majority) and hypertrophic scars or keloids (the minority) [5]. Several classifications and scales for scarring have been proposed. Goodman and Baron [6, 7] developed a qualitative scale and later presented a quantitative scale, while Dreno et al. [8] introduced the ECCA scale (Echelle d'Evaluation Clinique des Cicatrices d'Acné) [9]. Recent reviews have identified various epidemiological risk factors influencing acne presentation and severity, including demographic, genetic, hormonal, dietary, and personal factors. Among these, family history, age, body mass index (BMI), and skin type were highlighted as the strongest contributors. While numerous epidemiological studies have explored risk factors for acne presentation, fewer have specifically investigated those for acne severity and scarring. Notably, only two studies conducted in Singapore in 2007 evaluated acne severity and focused on the psychosocial factors affecting acne in teenagers [10, 11]. This research targets to study the prevalence of acne vulgaris among Bangladeshi adolescents and adults as well as the sociodemographic factors behind the issue. Ethical clearance and fully informed consent were ensured before the study.

1.1. Objectives
- *General objective:* The primary aim of this research was to study acne vulgaris in Bangladeshi adolescents and adults.

- *Specific objective:* This study targeted to evaluate prevalence and sociodemographic factors among Bangladeshi adolescent and adult people of Bangladesh.

2. METHODOLOGY

This retrospective study was done on 150 patients, who visited the Department of Skin & VD at Community Based Medical College Bangladesh, Winnerpar, Mymensingh with the symptoms of acne vulgaris. The population were both male and female aged between 15 and 30 and the study duration was from June 2020 to June 2022.

- *Inclusion criteria:* The current study included patients who had acne vulgaris symptoms during the study period.

- *Exclusion criteria:* Patients who were critically ill aside from acne vulgaris, below 15 or more than 25 years were excluded from this study.

Patients' data, including age, sex, medical conditions, family income, lifestyle and familial acne history were recorded. Patients were divided in to groups, control group and non-control group consisting 90 and 60 people respectively. The data were entered into an MS Excel spreadsheet, and the analysis was conducted using SPSS (version 21.0, Inc., Chicago, IL, USA). Independent t-tests were employed to compare the variables between the two groups. A p-value of ≤0.05 was considered statistically significant. The study was approved by the Community Based Medical College Review Board, and well-informed consent was obtained from all participants prior to enrollment.

3. RESULT

150 study patients participated in this study, who were divided into control (90 people) and non-control (60) groups. 56% of the study patients were Female participants and 70% belonged to the age group of 15-20 years. Mild acne severity was found in 74% patients [Table-1]. Table-2 shows that, familial acne history of the study patients were significant for both control and non-control groups. Atopy, asthma, allergic rhinitis, eczema, atopic diseases, PCOS were the most commonly found comorbidities among the patients [Table-3]. Use of computer/ TV was significant for 3 to more than 5 hours. On the other hand, milk consumption was insignificant for the study study patients [Table-4].

Table 1. *Sociodemographic data of the study patients*

Variable		Case (n = 150) (Control 90 & non-control group 60)
Gender	Male	66 (44%)
	Female	84 (56%)
Age	15-20 years	105 (70%)
	21-25 years	21 (14%)
	26-30 years	24 (16%)
Family monthly household income	<2,OOO SGD	27 (18%)
	2,000-3,999 SGD	48 (32%)
	4,000-5,999 SGD	30 (20%)
	>6,OOO SGD	42 (28%)
	Not stated	3 (2%)
Acne severity grades	Mild	110 (74%)
	Moderate	28 (18%)
	Severe	12 (8%)

Table 2. *Familial acne history of the study patients (control and non-control group)*

Familial history		Unadjusted		Adjusted	
		OR (95% Cl)	P	OR (95% Cl)	P
Maternal acne	Yes	2.094 (1.789-2.449)	<0.001	2.038 (1.724-2.409)	<0.001
	No	1		1	
Paternal acne	Yes	2.346 (1.981-2.779)	<0.001	2.292 (1.915-2.744)	<0.001
	No	1		1	
Parental acne	None	1		1	
	Only 1 parent	2.770 (2.252-3.413)	<0.001	2.565 (2.057-3.199)	<0.001
	Both	2.513 (2.049-3.077)	<0.001	2.487 (2.002-3.089)	<0.001
Sibling acne	Yes	1.726 (1.504-1.981)	<0.001	1.631 (1.408-1.890)	<0.001
	No	1		1	
Familial acne	None	1		1	
	At least 1 parent/sibling	2.538 (2.155-2.994)	<0.001	2.322 (1.951-2.764)	<0.001

Table 3. *Comorbidities found in the study patients*

Comorbidities		Unadjusted		Adjusted	
		OR (95% Cl)	P	OR (95% Cl)	P
BMI class	18.5-23	1	-	1	-
	<18.5	0.833 (0.700-0.990)	0.038	0.820 (0.686-0.980)	0.029
	>23	0.907 (0.765-1.075)	0.26	0.907 (0.713-1.154)	0.428

Atopy	Yes	1.166 (0.986-1.377)	0.072	1.244 (1.037-1.493)	0.019
	No	1		1	
Asthma	Yes	1.322 (1.043-1.675)	0.021	1.471 (1.125-1.923)	0.005
	No	1		1	
Allergic rhinitis	Yes	1.183 (1.028-1.362)	0.019	1.220 (1.051-1.417)	0.009
	No	1		1	
Eczema	Yes	1.318 (1.119-1.553)	0.001	1.350 (1.135-1.606)	0.001
	No	1		1	
Atopic diseases	Yes	1.356 (1.064-1.730)	0.014	1.488 (1.145-1.932)	0.003
	No	1		1	
PCOS	Yes	1.879 (0.981-3.601)	0.057	2.141 (1.035-4.428)	0.04
	No	1		1	

Table 4. *Lifestyle factors of the study patients*

Lifestyle factors		Unadjusted		Adjusted	
		OR (95% Cl)	P	OR (95% Cl)	P
Computer/TV usage	>1 h	1		1	
	1-3 h	1.318 (1.074-1.616)	0.008	1.253 (0.991-1.584)	0.059
	3-5 h	1.595 (1.290-1.972)	<0.001	1.550 (1.220-1.970)	<0.001
	<5 h	1.511 (1.218-1.876)	<0.001	1.423 (1.116-1.815)	<0.001
Milk consumption	Never/occasionally	**1.00**		**1.00**	
	Once or twice/week	0.738 (0.475–1.145)	0.175	**0.702 (0.459–1.074)**	0.103
	Most or all days	0.572 (0.360–0.910)	0.018	0.556 (0.354–0.873)	0.011

4. DISCUSSION

Acne is a prevalent skin condition worldwide. In Singapore, the acne prevalence among the Chinese population is 53.8%, similar to studies in China reporting 51.3% and 53.5% [12, 13]. The lack of a standardized grading system for acne severity complicates direct comparisons between studies [2]. In our Singaporean Chinese subjects, the prevalence of moderate and severe acne was 17.6%, notably lower than the 48.6% found in a previous study of adolescents aged 19 and younger [10]. A positive family history of acne in parents or siblings is strongly linked to a higher likelihood of developing the condition, with our meta-analysis showing a pooled odds ratio (OR) of 2.91 (95% CI: 2.58–3.28) for those with a parental history compared to those without [9]. However, the connection between family history and acne severity is mixed; some studies show a higher prevalence of severe cases in individuals with a positive family history [15, 16], while others do not find significant links [17–19]. In our study, positive paternal/parental history was associated with increased acne severity, and a sibling history was linked to greater scarring. Gender and age influence the severity and scarring of acne, but not its presentation. While the 2010 Global Burden of Disease Study [20] and Lynn et al. [21] suggested that females are more likely to experience acne, our findings show that males have only a slight increase in presentation risk (pooled odds ratio = 1.07, 95% CI: 0.42–2.71) [9]. Thus, there is no significant difference in acne risk between males and females, aligning with other studies [17, 22, 23].

This study found that moderate to severe acne and grade 3/4 scarring were more common in males than females, consistent with findings by Aksu et al. [17] and Kaminsky et al. [19] and by Layton et al. [24]

for acne scarring regarding age, moderate to severe acne was more prevalent in individuals under 19 compared to those over 24, corroborating research that shows a decrease in severe acne with age after 18, while milder acne increases until the early thirties [25]. The current study findings align with previous research that shows lower acne prevalence in underweight individuals compared to those of healthy weight. There is also a suggestive trend of lower odds of acne in overweight individuals, contrasting with earlier studies that reported higher prevalence in this group. We initially thought this might be due to the use of international BMI categories, but the trend persisted even with appropriate BMI classifications for an Asian population. A sensitivity analysis using BMI as a continuous variable did not show significant patterns. Additionally, acne presentation was linked to various comorbidities, including atopy, asthma, allergic rhinitis, eczema, and PCOS. Limited studies have explored the relationship between acne and atopic diseases. For example, while a significant association was found between severe acne and asthma, eczema was less common among acne cases, likely due to differences in sebum levels. Moreover, PCOS is reported to be more prevalent in women with acne than in the general population [1-18, 22, 26-32].

Among the evaluated lifestyle factors, computer and TV usage were significantly associated with acne presence, indicating that a sedentary lifestyle may contribute to higher acne rates. Previous studies have shown that individuals using computers for less than two hours daily have a lower risk of acne compared to those who use them more. The impact of smoking on acne remains debated, as some studies suggest it's a risk factor, particularly for severe acne, while others indicate it may lower risk in females. Additionally, research on smoking duration and frequency has produced mixed results regarding its relationship with acne severity. Furthermore, non-drinkers were found to have a higher risk of moderate to severe acne compared to drinkers, even after accounting for familial history. This finding contradicts prior studies that reported no significant link between alcohol consumption and acne severity or suggested that alcohol might exacerbate acne [1, 12, 18, 33-35].

The link between diet and acne has been widely debated. Some studies suggest that foods like milk and dairy may contribute to acne, while others find no significant connection. A meta-analysis found that overall dairy consumption could be a risk factor, and a high glycemic load might also increase acne risk. Conversely, other research, including a sensitivity analysis in Asia, showed no association between dairy products and acne, and a large study of 20,416 Danish adults confirmed these findings. Interestingly, our study indicated that frequent milk consumption might protect against moderate to severe acne, while butter consumption was linked to worse scarring. These differing findings may stem from ethnic dietary variations and the specific types of dairy assessed. In our study, other food groups, such as high-fat foods, fish, fruits, vegetables, and chocolate, showed no significant effects on acne presentation or severity. These influences have been reviewed in our recent work [9, 36-39].

5. CONCLUSION

According to the present study positive family history significantly influences the presentation, severity, and scarring of acne. Demographic factors, such as gender and age, along with a sedentary lifestyle marked by increased computer and TV usage, also affect acne outcomes. Additionally, dietary habits, particularly milk consumption, impact acne severity and scarring. These findings enhance our understanding of acne epidemiology in the Singaporean population and can guide future research on risk factors, supporting the development of effective interventions targeting lifestyle and dietary modifications.

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Conflicts of interest

No conflicts of interest were found

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