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"THE STUDY OF CORRELATION OF SEVERITY OF ACNE VULGARIS AND ITS IMPACT ON QUALITY OF LIFE AMONGST MEDICAL STUDENTS IN WESTERN MAHARASHTRA"

Dermatology

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ABSTRACT

Background : Acne vulgaris is one of the most common skin diseases amongst teenagers and young adults. affecting all ethnicities and races and has a considerable impact on quality of life.

Aim and objectives : The study was undertaken to observe the clinical profile of acne vulgaris and its impact on quality of life amongst young adolescents using Cardiff Acne Disability Index (CADI) .

Materials and methods : It was a hospital based cross sectional, questionnaire based study. A total of 156 medical students were involved in this study. Their clinical acne grading was done using Global Acne Grading System and its impact on quality of life was compared using Cardiff Acne Disability Index (CADI).

Results : The study group included 156 students with male to female ratio of 1.29 : 1. According to Global Acne Grading System, 73.07% of participants had mild acne (1-18). The median CADI score is found out to be 4, which indicates mild psychological impact of acne on quality of life. The most common aggravating factor was exam stress (70.51%) in our study.

Conclusion : There was low psychological impact of acne on quality of life amongst the study population owing to its mild clinical presentation. Global Acne Grading System and Cardiff Acne Disability Index (CADI) are the simple tools that can be incorporated in the routine management of patients with acne, in order to assess the severity of acne and its impact on quality of life.

KEYWORDS

Acne vulgaris, Global Acne Grading System, Cardiff Acne Disability Index.

INTRODUCTION :

Acne vulgaris is a chronic inflammatory disease of skin affecting the pilosebaceous unit . It is one of the most common skin diseases worldwide, affecting all ethnicities and races.[1] Nearly 90-95 % of world population suffers from acne at some time or another. The highest prevalence of acne occurs in adolescence where it may be diagnosed in 80% of all teenagers and it may persist through the early thirties. The age of onset has lowered over time due to earlier onset of puberty in recent years.[2] Overall it can affect a wide age range – infants, children and adults. Neonatal acne occurs due to circulating levels of maternal androgens and is self resolving. Acne is more common and severe in males than in females. Asians and Africans are more affected than the white population.

During puberty, Acne vulgaris is triggered by *Cutibacterium acnes* under the influence of normal circulating dehydroepiandrosterone (DHEA) . Under the influence of androgens, sebum secretion is increased as 5-alpha reductase converts testosterone to more potent dehydrotestosterone , which binds to specific receptors in the sebaceous glands . Distended follicles rupture and release pro-inflammatory cytokines into the dermis, stimulating inflammation. Furthermore, *C.acnes*, *Staphylococcus epidermidis* and *Malassezia furfur* induce inflammation and follicular epidermal proliferation.

Factors aggravating acne include the following :

1. Exposure to excess sunlight
2. Stress
3. Use of oil-based cosmetics, pomade
4. High glycaemic index diet (dairy products, junk food, chocolate, bakery products)
5. Use of occlusive wear like shoulder pads, headbands, backpacks, underwire brassieries
6. Endocrine disorders like polycystic ovarian syndrome and even pregnancy
7. Genetics affect the percentage of branched fatty acids in sebum, accounts to 50-90%. [3]

Acne clinically presents as polymorphic lesions. The clinical manifestations vary from non-inflammatory closed and open comedones to inflammatory papules,pustules, nodules and cysts.

Post healing acne may present as post-inflammatory hyperpigm entation or, atrophic or hypertrophic scars. Atrophic scars may be of icepick, boxcar or rolling type.

Acne is associated with seborrhoea and in case of hyperandrogenism associated with hirsutism, acanthosis nigricans, irregular menstruation and weight gain. Rarely, there may be itching may be related to the release of histamine like compounds from *C.acnes.* Discomfort may be present in truncal acne.

Syndromic associations of acne are :

CAH (Congenital Adrenal Hyperplasia), SAHA syndrome (Seborrhoea-Acne- Hirsutism- Androgenetic alopecia), Apert syndrome (associated with increased fibroblast growth factor R2 signalling), Polycystic Ovarian Syndrome (irregular menses, obesity, androgenetic alopecia, hirsutism,acne), HAIR- AN syndrome (hyperandrogenism, acne, insulin resistance, acanthosis nigricans), SAPHO syndrome (Synovitis- Acne-Pustulosis- Hyperostosis-Osteitis), PAPA syndrome (Pyogenic arthritis-Pyoderma gangrenosum-Acne). [4]

The combined impacts of acne frequently results in low self-esteem, emotional distress and psychiatric illness leading to psychosocial morbidity. This can be measured qualitatively using Cardiff Acne Disability Index. Successful treatment correlates with the improvement of psychosocial factors in many cases.

The aim of this study is to see the impact of acne on psychosocial aspect in college going students.

AIMS AND OBJECTIVES :

1. To study the epidemiology of acne vulgaris among medical students in Western Maharashtra.
2. To study the clinical profile of acne vulgaris in this group.
3. To provide an overview of the psychosocial impact of acne vulgaris using Cardiff Area Severity Index in the same group.

MATERIALS & METHODS :

A cross-sectional study was conducted among 200 medical students during December 2021 to in Western Maharashtra, out of which 156 were suffering from acne vulgaris. All students between the age group of 18-24 years irrespective of gender with clinical diagnosis of acne vulgaris were included in the study. The students with any medical illness or on any topical and systemic drugs known to cause acneiform eruptions were excluded from the study.

Informed written consent were taken of all the students and all data were recorded in a preformed proforma. Parameters evaluated were age, gender of the patient, weight, age of onset (<10 years / 10-14 years

/ >14 years); and duration of onset of lesions (< 1 month / <6 months / >6 months),site of lesions (face/ trunk / both / more than one site), family history(history of acne in siblings/ parents);any previous treatment taken (topical / systemic); aggravating factors (premenstrual flare/ stress-- less than 8 hours of sleep exam stress, anxiety and other psyhiatry disorders/ diet – chocolate or bakery products / seasonal exacerbations – summer or winter / sun exposure / hot and humid climate / cosmetics / history of medications for any other illnesses.

Every student filled a questionnaire of Cardiff Acne Disability Index (CADI) which is a validated, self reported questionnaire comprising a Likert scale with 5 response categories. Questions 1st and 2nd address the psychosocial effects of acne in general, the 3rd targets those with acne of the chest or back, the 4th enquires about the patient's psychological state, and the last question is used to assess current acne severity of the patient. The maximum score is 15 and the minimum is zero; the higher the score, more the quality of life affected. [5]

Grading of acne severity was done as per Global Acne Grading System as shown in the following table. It is a quantitative scoring system. Each type of lesion is given a value depending on severity. No lesion = 0, comedone = 1, papule = 2, pustule = 3, nodule = 4.

The score of each area(local score) is calculated using the formula :
Local score = Factor (F) x Grade (G); grade = 0 -4

The global score is the sum of local scores and acne severity is graded using global score with a maximum score of 44. The score 1–18 is considered mild, 19-30 moderate, 31-38 severe , >39 very severe. [6]

Location	Factor (F)	Grade(G) (0-4)	Local Score (F X G)	Global Score (Sum of local scores)
Forehead	2			
Right cheek	2			
Left cheek	2			
Nose	1			
Chin	1			
Chest & upper back	3			

RESULTS :
A total of 200 students from a government medical college in Western Maharashtra were included in the study, out of which 156 (78%) had active acne. Boys (88) to Girls(68) ratio was 1.29 : 1 . Mean age of the study population was 20.5 years (17-24) yrs with maximum affection (28.84%) seen in the age group >19-20 years. There age of onset was lower in girls in comparison to boys. (Table no. 1)

Tables

Table 1:age Wise Distribution Of Acne

AGE	NO OF PARTICIPANTS				TOTAL	
	MALE		FEMALE			
	No.	%	No.	%	No.	%
17-18 yrs	-		1	0.6	1	0.6
>18-19 yrs	15	9.61	6	3.84	21	13.46
>19-20 yrs	26	16.66	19	12.17	45	28.84
>20-21 yrs	14	8.97	12	7.69	26	16.66
>21-22 yrs	20	12.8	13	8.33	33	21.15
>22-23 yrs	8	5.12	12	7.69	20	12.82
>23-24 yrs	5	3.2	5	3.2	10	6.41
TOTAL	88	56.41	68	43.58	156	100

The most common site observed was forehead (92.94%) followed by chest and upper back (23.71%).(Table no .2)

Table 2: Site wise distribution of acne

SITE	NO OF PARTICIPANTS				TOTAL	
	MALE		FEMALE			
	NO	%	NO	%	NO	%
Forehead	80	51.28	65	41.66	145	92.94
Right cheek	85	54.48	63	40.38	148	94.87
Left cheek	81	51.92	65	41.66	146	93.58
Nose	53	33.97	46	29.48	99	63.46
Chin	60	38.46	50	32.05	110	70.51
Chest and upper back	21	13.46	16	10.25	37	23.71

The most common aggravating factor in our study group was found to be exam stress. (70.51%), followed by lack of sleep (41.66%). Premenstrual flare had significant association in females (28.2%) (Table no. 3)

Table 3: Aggravating factors of acne in study population

SR NO	AGGRAVATING FACTORS	NO OF PARTICIPANTS		TOTAL	
		MALE	FEMALE	No.	%
1	Exam stress	60	50	110	70.51
2	<8 hrs of sleep	38	27	65	41.66
3	Anxiety and other psychiatric illnesses	3	1	4	2.56
4	Other stresses	3	2	5	3.2
5	Premenstrual flare	-	44	44	28.2
6	Bakery products	18	28	46	29.48
7	Cosmetics	1	14	15	9.61
8	Sun exposure	26	17	43	27.56
9	Hot and humid climate	20	18	38	24.35
10	Summer	18	17	35	22.43
11	Winter	3	1	4	2.56
	TOTAL	190	205		100

There was no significant association found between development of acne and intake of medication for other illnesses. High glycaemic index diet was the aggravating factor in 46 (29.48%) students. Sun exposure also led to significant flare up of acne in 43 (27.56%) students. Summer exacerbation was noted in 35(22.43%) students but 2.56% (4) students had winter exacerbations. Acne was found to have aggravated in hot and humid climate in 38 (24.35%) students. Other aggravavting factors associated were cosmetics, anxiety and other psychiatric illnesses, others stresses. (Table no.3)

Acne was mild in majority of the students 114 (73.07%), moderate in 39(25%) and severe in only 3(1.92%). (Table no. 4)

Table 4: Acne Severity Score using GLOBAL ACNE GRADING SYSTEM based on gender

GRADE	NO OF PARTICIPANTS				TOTAL	
	MALE		FEMALE			
	No.	%	No.	%	No.	%
1 18 (mild)	66	42.3	48	30.76	114	73.07
19 30 (moderate)	21	13.46	18	11.53	39	25
31 38(severe)	1	0.64	2	1.28	3	1.92
39 – 44 (very severe)	-	-	-	-	-	-
TOTAL	88	56.4	68	43.58	156	100

Mild psychological impact of acne on quality of life in these students as per Cardiff Area Severity Index was found in the study population (73.71%). 25.64% had score in between 6-10 . Only 1 patient (0.64%) had score in between 11-15. (Table no. 5)

Table 5: Cardiff Acne Disability Index Score (out Of 15) Based On Gender

SCORE	NO OF PARTICIPANTS				TOTAL	
	MALE		FEMALE			
	No.	%	No.	%	No.	%
0 5	69	44.23	46	29.48	115	73.71
6 10	19	12.17	21	21	40	25.64
11 15	-	-	1	0.64	1	0.64
TOTAL	88	56.4	68	43.58	156	100

The average score as per CADI was found to be 2.74 in males and 3.91 in females in mild (0-18) acne as per GAGS ; 3.8 in males and 5.44 in females with moderate acne (19-30); 4 in males and 10 in females with severe acne (31-38). The more severe the acne, the greater the impact on quality of life. (Table no. 6)

Table 6:Comparison of acne severity (as per Global Acne Grading System) and its impact on quality of life (as per Cardiff Acne Disability Index)

ACNE SEVERITY SCORE	AVERAGE CARDIFF ACNE DISABILITY INDEX SCORE	
	MALE	FEMALE
0-18 (mild)	2.74	3.91
19-30 (moderate)	3.8	5.44
31-38 (severe)	4	10
39-44 (very severe)	_	_

DISCUSSION :

Acne vulgaris which is a common skin problem of adolescent age, mainly affecting face, chest and upper back can have negative impact on self esteem which can lead to depression and suicidal tendencies. [7,8] There are very few studies done in India to assess the impact of acne on quality of life. [9,10]

This study was conducted to determine the epidemiology and clinical profile of acne vulgaris in medical students aged 18-24 years in Western Maharashtra. In our study the prevalence was 78% which was found to be similar with a study conducted by Sharma et al (72.3%). [11] The factors that might explain the differences in prevalence of acne between the different studies include variation in : study design, genetic differences, age of study population, socioeconomic status, environmental factors, skin type, use of cosmetics, mode of diagnosis either through self reporting, diagnosis by general clinician or by dermatologist. In our study, we classified acne using Global Acne Grading System .

Studies conducted by Aksu et al and Kaminsky et al [12,13] showed that acne is more prevalent in male which is in accordance with our study (56.4%). It was higher as compared to female (43.58%). This can be explained by the difference in characteristics of sampled population or country studied as well as higher androgen level in males as compared to females. [14]

In a study conducted by Adityan and Thappa [15] involving 309 patients with acne vulgaris, face was involved in all patients followed by back, chest, neck and arm(28.2%). Similarly in our study also, the most common site was found to be face (83.07%), followed by chest and upper back (23.71%).

Aggravating factors of acne :

Wang et al, Wei et al and Wu et al conducted studies which showed lack of sleep is a significant risk factor in the development of acne , which correlates with the results of our study (41.66%). [16,17,18] Ibrahim et al suggested sun exposure and hot and humid climate as a cause of flaring up of acne [19] In the present study , association with sun exposure and hot, humid climate was found to be 27.56% and 24.35% respectively. It is commonly assumed that diet is strongly associated with development of acne and its exacerbation. Few studies found that chocolate intake was associated with acne severity. [20,21] Our study showed 29.48% acne prevalence among students consuming bakery products (sweets,chocolate). In a study conducted by Sharma et al, 21.15% of cases had premenstrual flare of acne [11] whereas our study had slightly more number of students (28.2%). In our study we found that use of cosmetics has led to acne among some students (9.61%)similar to study conducted by Wu et al. [18] There was no significant association found between acne severity and winter exacerbation in any study however we found 2.565 association between the two in our study. Probable explanation for this could be subjective assesment error.

Mental stress is found to be another significant risk factor in a study conducted by Di Landro et al (8.8%). [22] In our study we derived that mental stresses like exam stress 70.51%, anxiety and other psychiatric illnesses 2.56%, other stresses 3.2% has maximum impact on quality of life in acne patients. The sub scales in CADI are feeling of aggression, frustration, interference in interpersonal relations, avoidance of public changing facilities and appearance of skin. In present study, 61.53 % of adolescents had difficulties in the area of emotion while 48.07% had social difficulties.

Only 1 patient (0.64%) in our study had CADI score in between 11-15 that is equal to severely impaired and majority (73.71%) had a CADI score in between 0-5 i.e. mild. The median score of CADI was 4 which is low. Similar observation is reported by Hanisah et al (median =4**).** [10] This shows that in this study population the students had mild psychological impact of acne. This could be explained by the mild grade of acne found in majority (73.07%) of students in our study group.

CONCLUSION:

Acne vulgaris which is a common problem among teenagers and adolescents can adversely affect the self esteem and social involvement. Hence assessment of quality of life in patients with severe involvement by acne vulgaris is crucial in identifying those at risk of aquiring psychological morbidities, so that timely referral can be done towards a psychiatrist/psychologist and better outcome can be achieved.

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