ORIGINAL ARTICLE

An observational study of depression in patients of acne vulgaris

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ABSTRACT

Background: Acne is one of the commonest skin conditions. There is a noticeable coincidence of acne and depression.
Objective: To evaluate the risk of depression and find the prevalence among acne vulgaris patients coming to the OPD.
Material and Method: This descriptive observational study included 300 patients with acne vulgaris. Brief patient health questionnaire 9 (PHQ-9) was used to evaluate depression amongst patients. Factors such as age, sex, marital status, residence (urban/rural) and severity of acne were noted to assess if they were risk factors for depression.
Result: The prevalence of depression was found to be 10.33% in patients with acne. The severity of acne was a risk factor with Grade III acne vulgaris being the highest (27.65%). Females (61.29%) were affected more than men (38.71%).
Conclusion: To prevent grave undesirable consequences to the mental health of the patients, it is mandatory for the treating dermatologist to screen for mental disorders in all patients of acne vulgaris. Recognition of pertinent psychological signs and use of appropriate questionnaires should become a routine component of patient encounters.

KEYWORDS: Acne, Depression, Anxiety, Isotretinoin, PHQ-9

INTRODUCTION

Around 80% of teenagers are affected by acne vulgaris. The age group commonly affected lies between 11–30 years.[1] It was once considered to be a disease of hormone-raging adolescents, acne is now recognized as a condition that affects people at any age. Acne is more prevalent in males than in females, and when males seek treatment, they present with more severe acne.[2,3,4] Females with acne, however, report significantly higher levels of embarrassment than their male counterparts.[5] Acne affects the emotional health of both genders.[6] Acne affects virtually every aspect of one's life: social, vocational and academic.[7] Those with severe acne have, on an average, worse academic functioning and higher unemployment rates compared to those without acne.[8] Further emphasizing the life altering effect that acne can have on a patient, levels of social, psychological, and emotional problems in acne patients have been compared to those patients with other chronic disabling diseases such as asthma, epilepsy, diabetes, back pain, and arthritis.[9] Patients with mild to moderate acne have higher depression scores than patients with alopecia areata, atopic dermatitis or psoriasis affecting less than 30% of total body surface area. Social dysfunction has also been observed, including concerns about social interactions and appearances in public.[10] Less body gratification has

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been noticed.[11,12] It can be negatively associated with intention to participate in sports and exercise.[13] Isotretinoin is commonly prescribed for acne. US Food Drug Administration in 2005 issued a black box warning for psychosis, aggression, depression and suicide.[14] Given this potential link, an appropriate screening is necessary to establish an underlying undiagnosed depression. This study aims at finding the prevalence of depression in patients of acne from India, since there is limited data from this region.

MATERIAL AND METHODS

It was a descriptive observational study with the study group comprising of 300 patients with acne vulgaris.

Inclusion Criteria:

1. All patients with clinically diagnosed acne vulgaris.
2. Patients between 12 years and 60 years of age of either gender.

Exclusion Criteria:

1. All patients on drugs potentially causing depression.
2. History of Psychiatric Illness.
3. All patients who are handicapped or have a chronic debilitating disease.
4. Patients with an associated chronic skin disorder.

PROCEDURE

A descriptive observational study was conducted after receiving ethical approval from Indian Ethical Committee, during a period of 2 years extending from 2017 to 2019 at Department of Dermatology, Venereology and Leprosy at Vikhe Patil Hospital, Ahmednagar. All patients with acne were selected. Informed consent was taken from the patients. The patients were clinically examined. The duration and progress were noted. They were systemically examined for any other co-existing diseases. To grade the severity of acne, Global acne grading system was used. Brief Patient Health Questionnaire 9 (PHQ-9) was used to screen for depression in patients. This questionnaire had 9 questions. The questionnaire consisted of two parts. The first part included socio-demographic details such as age, sex, marital status, residence (urban/rural). The second part consisted of the assessment of the symptoms. A total score varied from 0-27, based on the symptoms. A score of more than 10 was referred to the psychiatric department for further evaluation. The final evaluation and the results of the study were based on the psychiatrist's expertise.

STATISTICAL ANALYSIS

All data analysis was done by using SPSS (version 22) for windows. The initial measures of each group were compared with the final measures of the study period and compared between the groups by using student t test and chi square test.

OBSERVATIONS AND RESULT

Three hundred patients were included in this study. Table 1 shows the prevalence of depression among acne patients. It was found to be 10.33% in patients with acne. Table 2 illustrates the prevalence of depression among acne patients according to age. Amongst them, majority of the patients belong to the age group of 12-20 years (48.39%) followed by 21-30 years (45.16%). Table 3 reveals prevalence of depression according to sex. Among 31 patients with depression, ma-

jority of patients with depression were females (61.29%), while males were 38.71%. From table 4, we can infer the prevalence of depression among acne patients according to severity of acne. Majority of the patients with depression were in Grade III (27.65%) followed by Grade I (21.12%). Table 5 shows the association of demographic characters and depression among acne patients. It was observed that depression showed no statistically significant difference with respect to age, sex, marital status and residence(P>0.05). Table 6 shows association of demographic characters and depression among acne patients with multivariate analysis.

It was observed that depression showed no risk factor with respect to age, sex, marital status and residence. (P>0.05)

The severity of acne was the only risk factor for depression among patients with statistically significant difference.

Table 1 Distribution of patients according to prevalence of depression

Depression	No. of Patients	Percentage
Present	31	10.33
Absent	269	89.67
Total	300	100

Table 2 Prevalence of depression according to age

Age Group (years)	No. of Patients	Patients with Depression	% of Patients with Depression
12-20	164	15	48.39
21-30	109	14	45.16
31-40	11	2	6.45
41-50	10	0	0
51-60	6	0	0
Total	300	31	10.3

Table 3 Prevalence of depression according to sex

Gender	No. of Patients	No of Patients with Depression	% of Patients with Depression
Male	112	12	38.71
Female	188	19	61.29
Total	300	31	10.33

Table 4 Prevalence of depression according to severity of acne:

Sevenity	No. of Patients	No of Patients with Depression	Prevalence of Depression in %
Grade I	142	03	21.12
Grade II	80	09	11.25
Grade III	47	13	27.65
Grade IV	31	06	19.35
Total	300	31	10.33

Table 5 Distribution according to factors association of depression in acne patients

Characteristics		Depression		Total	P Value
		Present	Absent		
Age (Years)	<25	24	190	214	P=0.36
	>25	07	79	86	
Sex	Male	12	100	112	P=0.49
	Female	19	169	188	
Marital Status	Single	18	174	192	P=0.72
	Married	13	95	108	
Residence	Urban	21	151	172	P=0.41
	Rural	10	118	128	

DISCUSSION:

Depression is a mood disorder that causes a per-

Table 6 Risk factors for depression in acne patients: (Multivariate analysis)

Variables		B	Standard error	Adjusted OR	95% CI
Age (years)	<25*	-	-	-	-
	>25	-0.312	0.71	0.64	0.38-1.09
Sex	Male*	-	-	-	-
	Female	1.211	0.41	0.91	0.78-2.31
Marital Status	Single*	-	-	-	-
	Married	0.811	0.45	0.59	0.29-1.17
Residence	Urban*	-	-	-	-
	Rural	0.672	0.53	0.63	0.31-1.13
Severity	Grade I*	-	-	-	-
	Grade II	1.212	1.26	1.69	0.88-2.63
	Grade III	2.841	1.28	2.38	1.12-9.01
	Grade IV	3.763	1.37	5.15	2.03-11.12

(* Reference category)

sistent feeling of sadness and loss of interest[15,16] The common features of all the depressive disorders are sadness, emptiness, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function.[17]

The impact of acne on body image is considered to be a contributory factor for depression. The treatment of acne is incomplete without addressing the treatment of these comorbidities.[18,19] In acne vulgaris, the hyperproliferation of epithelium occurs due to intertwined complex series of overgrowth of *Propionibacterium acnes*, sebum lipid composition, raised androgen levels, the individual sensitivity to it and effect of the pro-inflammatory cytokines.[10] *Propionibacterium acnes* and innate immunity prompts a series of events at the level of pilosebaceous unit. Chemotactic free fatty acids produced from breakdown of triglycerides attract inflammatory cells. Pro-inflammatory cytokines like IL-1, IL-6, IL-8, IL-10, IL-12 and tumour necrosis factor alpha are released from the ductal epithelium. Type IV immune reaction to antigens in the follicle continues the inflammatory reaction.[10]

A similar correlation of cytokines is seen in Depression. Certain pro-inflammatory cytokines such as TNF-α and IL-6 cross the blood-brain barrier (BBB). A "leaky BBB" results due to stress, thus compromising its integrity. This results in an inadequate protection of the brain from the peripheral cytokine infiltration which eventually leads to an overactive stress response. An increased levels of TNF-α will cause an augmentation in the breakdown of neurotransmitters, such as serotonin. Oxidative stress will also result from central inflammation. This results in decrease in neurogenesis in several brain regions which are implicated in depression including the hippocampus.[11] The common cytokines involved can precipitate depression or be a cause of acne vulgaris. This bidirectional relationship involves a common denominator of psychological stress and similar inflammatory responses between depression and acne vulgaris.

In the present study, the maximum numbers of cases are in the age group of 12-20 years (54.67%), followed by in 21-30 years (36.33%).

The patients range from 12 to 60 years and mean age among the distribution of cases is 22 years. Out of 300 cases, in our study, females (188 cases; 62.67%) are the most affected with acne when compared to males (112 cases; 37.33%). Similar findings are seen in a study by Javad Golchai et al where amongst 82 acne vulgaris patients,56 were women and 26 men with mean age of 21.22 years.[21]

Likewise, Elizabeth Uhlenhake et al found in acne patients who are more than 18 years old, a majority of females (65.2%) particularly between 36-64 years age group.[8] Saif Mutair et al found how prevalent depression was amongst acne patients. Age varied between 14 and 39 years with an average of 23.9 ± 5.7 years and more than half of the participants were females (56.1%).

In this study, the maximum numbers of patients are found to be single 64% and married are 36%. The maximum number of patients with acne vulgaris are from urban area (57.33%) followed by rural area (42.67%). In the current study, severity of acne among patients show a majority of patients belonging to Grade I severity (47.33%) followed by Grade II (26.67%), Grade III (15.67%), and Grade IV (10.33%). A similar result was seen in a study by Javad Golchai et al. a total of 82 acne patients were included. Of these, 46.3% patients had mild acne, 45.2% cases had moderate acne and 8.5% cases had severe acne. [21]

In our study, the prevalence of depression was found to be 10.33% in patients with acne. Among 31 patients with depression, majority of patients belong to age group 12-20 years (48.39%) followed by 21-30 years (45.16%). The majority of patients with depression are females (61.29%) while males are 38.71%.

Javad Golchai *et al*. compared the prevalence of anxiety and depression in the patients with acne vulgaris and normal population. They observed that the prevalence of depression was 25.6% among patients of acne vulgaris.[21]

Elizabeth Uhlenhake et al observed a clinical depression of 8.8% amongst acne patients. They also detected two to three times increased prevalence of depression in acne patients when compared to the control.[22]

Saif Mutair et al. stated that they found depression in a massive 40.8% of acne patients. Patients with even mild acne showed depression in 16.2% individuals. Whereas, moderate and severe both showed depression in 12.3% each.[23]

Elizabeth Uhlenhake *et al* observed a twofold increase in depression amongst females (65.2%) when compared to their male counterparts (10.6% females vs. 5.3% males).[84]

Saif Mutair et al observed 18.8% of female acne patients had severe depression as compared to 4% of male acne patients.[23]

In this study, among 31 patients with depression, majority of patients had Grade III acne (27.65%) followed by Grade I acne (21.12%).

In the present study, it is observed that depression shows no statistically significant difference and no risk factor with respect to age, sex, marital status and residence ($P>0.05$). However, the severity of acne is a risk factor for depression among patients with statistical significant difference ($P<0.05$).

Contradictory to this study, Saif Mutair et al concluded with a positive association of depression among acne patients with patient's age, gender along with a similar finding with respect to the severity of acne.[22]

Similar to our conclusions, in studies conducted by Wu SF *et al*, Pearl *et al*. and Grahame *et al*,

they noticed a linear relationship between increasing acne severity and increasing anxiety and depression severity.[24,25,26]

In contrast to the results of present study, there was no relationship seen between the severity of acne and severity of depression, observed in a study done by Yazici.[27]

In a study of skin diseases, 7 out of the 16 cases who had acne, committed suicide.[21] None of our patients had any suicidal tendencies when followed up.

CONCLUSION:

Recognition of pertinent psychological signs should become a routine component of patient encounters. It is suggested that all patients with acne irrespective of gender, marital status, age, severity or its complications should be screened and referred appropriately.

With the chronic use of Isotretinoin, potential side effects of which include depression and suicide, an appropriate screening for depression must be done in all susceptible patients. This can be done using PHQ-9, a questionnaire which is easy to use in the OPD with high sensitivity and specificity.

Hence, our study is an attempt to help dermatologists achieve improvements in clinical outcomes, compliance and holistic care in the life of their patients using questionnaires like PHQ-9.

LIMITATIONS

Comparison to healthy individuals was not done. ELISA or flow cytometry was not performed to evaluate and correlate the levels of cytokines in depression and acne patients.

BRIEF-PATIENT HEALTH QUESTIONNAIRE 9

This questionnaire is an important part of providing you with the best health care possible. Your answers will help in understanding problems that you may have. Please answer every question to the best of your ability unless you are requested to skip a question.

Name: Age: Sex: Marital Status: Residence: Date:

Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all	Several days	More than half the days	Nearly every day
a. Little interest or pleasure in doing things	☐	☐	☐	☐
b. Feeling down, depressed, or hopeless	☐	☐	☐	☐
c. Trouble falling or staying asleep, or sleeping too much	☐	☐	☐	☐
d. Feeling tired or having little energy	☐	☐	☐	☐
e. Poor appetite or overeating	☐	☐	☐	☐
f. Feeling bad about yourself, or that you are a failure, or have let yourself or your family down	☐	☐	☐	☐
g. Trouble concentrating on things, such as reading the newspaper or watching television	☐	☐	☐	☐
h. Moving or speaking so slowly that other people could have noticed. Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual	☐	☐	☐	☐
i. Thoughts that you would be better off dead, or of hurting yourself in some way	☐	☐	☐	☐

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