ORIGINAL ARTICLE

The Psychological Impact and Functional Disability of Patients With Acne Vulgaris in Hospital Serdang, Malaysia: A Cross Sectional Analysis

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ABSTRACT

Introduction: Acne vulgaris is not only associated with physical morbidity, but also associated with significant psychosocial disturbances, such as depression and suicide. The objective of this study was to examine the functional disability and psychological impact of acne vulgaris. **Methods:** A cross-sectional study of 55 acne patients, aged more than 12, was conducted in the dermatology clinic of Serdang Hospital from January to March 2017. Data on demographics, clinical features, current treatment modalities were collected. Acne severity was graded using Comprehensive Acne Severity Scale (CASS), Cardiff Acne Disability Index (CADI) was used to assess functional disability, while DASS-21 was used to assess three related states of depression, anxiety and stress. Statistical analysis was done using SPSS software. A p value ≤ 0.05 considered significant. **Results:** The mean age was 23.2 (14-46), majority were females (39, 70.9%), Malays (44, 80%) and students (34, 61.8%). 53 (96.4%) subjects had almost clear (CASS = 1) to moderate (CASS = 3) acne severity. Majority had facial acne with or without truncal involvement, 53 (96.3%). The average age of disease onset was 17.8 (9-45). 45 (81.8%) patients found their acne mild to moderately disabling. 69.1%, 45.8% and 41.8% reported feeling anxious, depressed and stressed out. CADI was found to be significantly related with depression (p=0.012), anxiety (p= 0.015) and stress (p=0.001). Relationship between CASS with CADI (p=0.07), stress (p=0.09), anxiety (p=0.13) and depression (p=0.12) were insignificant. **Conclusion:** Although acne vulgaris is not hazardous, it is associated with psychosocial disturbances. Early and effective treatments are necessary, especially when dealing with facial lesions.

Keywords: Depression, Anxiety, Stress, DASS-21, Acne vulgaris

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INTRODUCTION

Acne vulgaris (AV) is a chronic disease due to inflammation of the pilosebaceous unit. It was named as the eighth most prevalent disease worldwide (1). AV affects 85% of young adults aged 12-25 years. In 2004, over 2.2 billion U.S dollars had been used for acne treatment in United States (2). The disease is characterized by the inappropriate keratinization of follicular epithelium which subsequently causes obstructive and inflammatory lesions. Proliferation of Propionibacterium acnes also contributed to the pathogenesis of acne. Although clearance occurs mostly before 25 years of age, acne lesion can persist into middle age for both sexes (3). Acne have a wide range of potential harm and associated cost. This includes physical discomfort, scarring, psychosocial distress, and potential psychiatric diseases, such as depression and suicide (4). Dermatologic patients experience psychologic symptoms more commonly than healthy people without skin diseases. Psychosomatics may play a part in the pathogenesis of AV (5). It has been speculated that stress could upregulate sebum production via substance P receptors, causing an AV flare (6). The objective of the study is to examine the functional disability and psychological impact of acne vulgaris among patients who attended dermatology outpatient clinic in Hospital Serdang, Malaysia.

MATERIALS AND METHODS

This cross-sectional, questionnaire-based study was done in 55 consenting patients, aged 12 and above, who attended the Dermatology outpatient clinic of Serdang Hospital, Malaysia from January 2017 to March 2017. Patients with other forms of acne (acne conglobate, acne mechanica, acneiform eruption of any causes) were excluded. As this was a study meant to be a pilot screening purpose in our clinic setting, no proper

sample size calculation was done.

A detailed history pertaining to the demographics, clinical features, current treatment modalities were elicited. A thorough dermatological examination was performed to grade the acne severity according to Comprehensive Acne Severity Scale (CASS). Cardiff Acne Disability Index (CADI) (7) was used to assess functional disability, while 21 item version of Depression Anxiety and Stress Scales (DASS-21) was used to assess three related states of depression, anxiety and stress.

CADI is a validated, self-reported questionnaire. It consists of five questions with a Likert scale and four response categories (0-3). The five questions relate to feelings, social life and relationships, skin exposures, overall severity. The final score ranges from 0 to 15. The higher score implied a higher level of functional impairment. We graded the level of impairment as mild (0-5), moderate (6-10) and severe (11-15) as per previously published (8). Permission to use this questionnaire was granted by Professor Andrew Y Finlay (License ID CUQoL136). An English version and translated Bahasa Malaysia version were used in this study.

CASS is an assessment tool to assess severity of facial acne. It significantly correlates with the Leed's technique for assessment of facial, and truncal acne. However, it appears to be a simpler method to be used in clinical practice. The assessment was done at a distance of 2.5 meters away from acne on face, chest and back. The severity of each region is graded on a 0 to 5 scale (9).

DASS is a screening tool to assess symptoms of depression, anxiety and stress. This instrument consists of three sub-scales, namely depression, anxiety and stress. In the depression sub-scale, hopelessness, low left esteem, and low positive affect were measured. Autonomic arousal, musculoskeletal symptoms, situational anxiety and subjective experience of anxious arousal were assessed in the anxiety subscale. Tension, agitation and negative affect were otherwise measured in the stress subscale. DASS consist of 2 versions, that are the full 42-item and the short 21-item versions. 21 item version of DASS (DASS-21) is easier to be used in clinical setting, and thus opted to be used in our study. Both validated English and Malay version had been used.

SPSS version 22 (SPSS Inc., Chicago, IL, USA) was used to analyzed collected data. Categorical data were asserted as frequencies and percentages. Continuous data were reported as either means with standard deviations or median with interquartile range. Fisher-exact test was used to investigate categorical data. A p value of < 0.05 was deemed significant.

RESULTS

Demographic data

A total of 55 patients (16 males, 39 females; 29.1% and 70.9%, respectively) were enrolled in the study (Table I). The median age was 23 (range: 17-28). Ethnic groups of the cohort included, Malay, 44 (80%); Chinese, 10 (18.2%) and Indian, 1 (1.8%).

Table I: Demographic and clinical features of the study population

Demographic		Frequency
Gender (M:F)		1:1.89 (16:39)
Race	Malay	44 (80%)
	Chinese	10 (18.2%)
	Indian	1 (1.8%)
Median Age		23 (range: 17-28 years old)
Lesion Type	Comedonal	39, (70.9%)
	Papule	47, (85.5%)
	Pustules	31, (56.4%)
	Nodular	6, (10.9)
	Cystic	2, (3.6%)
Severity	Almost Clear	9 (16.4%)
	Mild	20 (36.4%)
	Moderate	24 (43.6%)
	Severe	1 (1.8%)
	Very Severe	1 (1.8%)
Treatment	LA Antimicrobial	40 (72.7%)
	LA Retinoids	22 (40%)
	Combination	2 (3.6%)
	Azelaic acid	1 (1.8%)
	Sulphur	5 (9.1%)
	PO Antibiotic	25 (45.5%)
	PO Isotretinoin	9 (16.4%)
	CAM	2 (3.6%)
	Not on treatment	7 (12.7%)
Area affected	Face	30 (54.5%)
	Trunk	2 (3.6%)
	Face & Trunk	23 (41.8%)

*LA: local application; PO: per oral; CAM: complementary & alternative medicine

Acne severity

Overall, patient with almost clear to mild acne was seen in 29 patients (52.8%); moderate acne was seen in 24 (43.6%), and severe to very severe acne was seen in 2 patients (3.6%). Although female patients comprised of 70.9% of the study population, only 35.9% were having moderate to severe acne. In comparison to the male patients, 75.1% them who sought treatment were having moderate to severe acne (Figure 1).

Site of distribution

Majority had facial acne with or without truncal involvement, 53 (96.3%). Out of this, 23 (41.8%) had

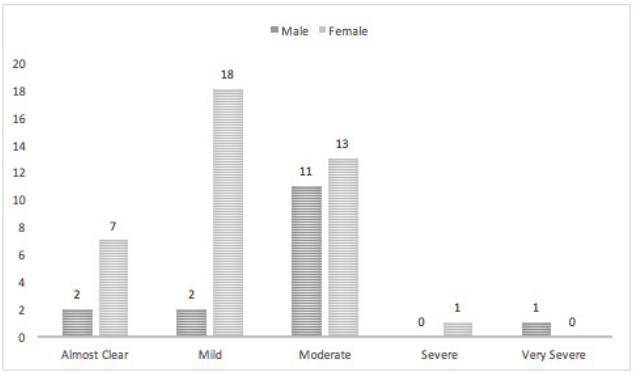

Figure 1: Severity of acne in according to gender

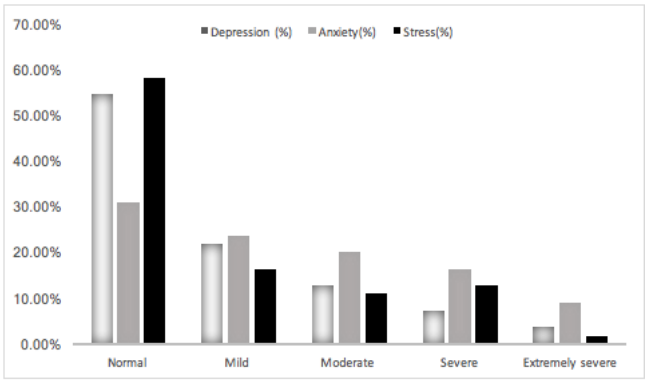

Figure 2: Frequency of psychological symptoms in according to severity

both facial and truncal involvement while remaining had pure facial involvement 30 (54.5%). Only 2 patients had pure truncal acne.

Age of acne onset and duration of acne

76.4% of the patients had an onset of acne between 11-20 years old. 21.9% had acne onset after the age of 21, while the remaining are before the age of ten. 96.4% of the patients had acne duration of less than 18 months, in which 70.9% presented during the first 6 months of acne onset, while 16.4% presented before 1 year of onset.

Treatment received

40 (72.7%) received topical benzoyl peroxide, 22 (40%) received topical tretinoin, 25 (45.5%) received oral antibiotics and 9 (16.4%) received oral isotretinoin, as the treatment for AV.

Functional disability

The mean CADI score was 7 ± 3.72. Recorded impairment levels included: mild, 19 (34.5%); moderate, 26 patients (47.3%); and severe, 10 patients (18.2%) (Table II). The mean score of the question were: feeling of aggression (Q1), 1.53 ± 1.00; interference with social life (Q2), 1.29 ± 1.00; avoidance of public changing facilities (Q3), 0.84 ± 1.10; appearance of the skin all over the last month (Q4), 1.71 ± 0.88; and indication of how bad the acne is now (Q5), 1.64 ± 0.85.

Table II: Result of functional disability using CADI©

	Q1	Q2	Q3	Q4	Q5	Total
Mean ± SD	1.53 ± 1.00	1.29 ± 1.00	0.84 ± 1.10	1.71 ± 0.88	1.64 ± 0.85	7 ± 3.72

Psychological morbidity

Less than half of the patients reported symptoms of depression (45.5%) and stress (41.8%). Out of the patients who reported symptoms of depression, 7 patients (12.7%) had moderate symptoms, while 4 (7.3%) and 2 (3.6%) reported severe and extremely severe depression. Among latter, only 2 had physician graded severe and extremely severe acne. 3 of them were treated with isotretinoin (Figure 2).

69.1% of the patients reported symptoms of anxiety. Out of this group of patients, 13 (23.6%) and 11 (20%) patients reported mild and moderate anxiety symptoms. The remaining falls in to the group of severe and extremely severe anxiety, in which each have 9 (16.4%) and 5 (9.1%) each. 6 patients (16.4%) were reported having moderate stress, while 7 (12.7%) and one (1.8%) falls into the range of severe and extremely severe stress range.

Factors associated with functional disability and psychological impact

CADI was found to be significantly related with depression (p=0.012), anxiety (p= 0.015) and stress (p=0.001). No significant relationship was found between sex and ethnicity with CADI (p= 0.345, and p=0.800, respectively). We found no significant relationship between gender or CASS with DASS. There was no significant relationship between CASS and CADI (p=0.182).

DISCUSSION

In our study, near 80% of the patients have an age of acne onset between the age of 11-20 years old. This is consistent with the finding that 85% of the age of acne onset is between the age of 12-24 years old (10). This is most likely due to hormonal surge before and during puberty. Male patients who seek dermatology consult have more severe acne. Similar finding is shown in several other community based studies (11,12). The oilier complexion and higher androgen levels are believed to be the cause. A study conducted in Nottingham shows that only 22% of the adolescence had talked to a doctor in regards to their acne. There is clearly a difference in the health seeking behavior among gender, whereby only 42% of the male patients in comparison to 70% of the female patients had talked to a friend about skin problem (13). Thus, male patients typically seek help only when their acne is easily noticeable. Furthermore, females were found to be experiencing more embarrassment due to acne (14,15), which leads to earlier dermatology consultation.

A study on acne disability index among patients who attended dermatology outpatient clinic in Sarawak (8) found a mean CADI score of 5.1± 3.83, which is lower than our study. This can probably be explained by the fact that our study have more patients with moderate acne severity. The difference observed can probably due to demographic and socio-economic background differences (16,17). However, in comparison with community based studies (11,12,21), hospital based studies (8,19) have shown significant higher amount of disability. This might be due to the fact that patients who sought treatment in specialist dermatology clinics may have more psychological distress in view of their condition even before the consultation (8). The hospital based study typically target young adults, while the community based study are mainly adolescents or late adolescents. Young adulthood entails significant transition. Path such as college, employment, relationship, marriage may be involved during this transition, in which each has its own implication. It was found that almost half of the lifetime diagnosable problems present by the age of 14 while nearly three quarters of the symptoms of lifetime problems started by the age of 24 (18). This age difference may have cause the difference in functional disability index. Overall, the impact of acne on quality of life or functional disability is very hard to compare, as majority of the studies have different questionnaire design, study setting and population characteristic (19).

CADI assess the perception of aggression, social life interference, public changing amenities avoidance, skin appearance and self-perceived acne severity. The least affected components were social life interference and public changing amenities avoidance, in which our patients scored 1.29 ± 1.00 and 0.84 ± 1.10 each. This finding is consistent with 2 other studies conducted in Malaysia (8,11). A French based study on school pupils with acne revealed that only 20% of the pupils have their personal and social life affected and only 10% avoided swimming and other sports because of embarrassment (20). Similar findings were found in a Nigerian based study (21). It had been postulated that this may either suggest that extra-facial acne is uncommon, or such lesion have no effect on patients using the public changing facilities, or even because the vast majority of respondents may not need public changing facilities as they don't participate in outdoor activities (21). Although acne is common, it is mainly of mild severity (11,12,19,21). The prevalence and the mild severity may explain why acne doesn't interfere much with social life.

It is found that 31% of the dermatology patients has psychiatric morbidity, in comparison with general population (22). Thus, it is crucial to screen for this symptoms among our dermatology patients. DASS-21 is widely use to screen for symptoms of depression, anxiety and stress in community setting. Its' positive result need further proper psychiatric evaluation before a final diagnosis could be given. According to Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition), major depressive disorder is defined as having severely depressed mood that persist for at least 2 weeks. Generalized anxiety disorder is characterized by worry for most days for at least 6 months. In our study, about 70% of the patients are screened positive for anxiety, while less than 50% of the patients are screened positive for depression and stress. However, further proper psychological evaluation is needed to confirm the diagnosis. There is no significant relationship found between anxiety, depression and stress with gender and severity of acne. A cross-sectional study in Iran, showed an anxiety prevalence of 68.3% while the prevalence of depression was found to be 25.6% (23). Our study has comparable prevalence of anxiety, but higher reported depression symptoms in comparison to this Iranian study. Our study shows a huge difference in comparison with other studies conducted (24-26) which shows an anxiety rate of 24.7% to 38.4%, while depression rate range from 13.3% to 29.5%. The possible explanation is the use of different acne severity scales and anxiety, depression screening tool. A study using DASS-21 and Hospital Anxiety Depression Scale (HADS) in rheumatoid arthritis patients have found near similar anxiety mean score in between both groups while higher mean depression score in patients who answered to DASS-21 (27). It might be also because of the socio-economic, cultural and climatic differences that have attributed to the different coping mechanisms to deal with the diseases.

Stress is rather poorly researched in patients with acne vulgaris. In our study, we have found almost 40% of patients reported stress symptoms. As this is a cross-sectional study, it is rather impossible for us to correlate if this is related to acne vulgaris. However, neuroimaging has demonstrated the presence of substance P receptor on sebaceous gland and the production of sebum is increased when this receptor is activated (28). It has been speculated that stress could upregulate sebum production via this receptor, which cause acne vulgaris flare (6). Thus, if stress is not properly addressed, the control of acne vulgaris might not be satisfactory. However, further study is needed to confirm this postulation.

In our study, CADI is found to be significantly related with depression (p=0.012), anxiety (p= 0.015) and stress (p=0.001), which is a not surprising finding, as psychological symptoms are frequently related with functional disability (20). Though both are related, each sets of questionnaires measure different aspect and thus both sets of questionnaires should be used in future studies.

Oral isotretinoin is approved by the United States Food & Drug Administration (FDA) for treatment of severe

recalcitrant acne vulgaris. It is recommended as a first line for severe acne or second line for moderate acne that failed to respond to conventional treatment (31-33). Almost half of the subjects in our studies had moderate acne. It was found that nearly half of the subjects were screened to have symptoms of depression. FDA had imposed a warning on the usage of isotretinoin may lead to suicidal thoughts or actions in July 2005 (34). Concern may arise in the use for this agent for the treatment of moderate-severe acne vulgaris. A recent systematic review and meta-analysis had failed to demonstrate the association of depression and isotretinoin treatment. Instead, the treatment of isotretinoin appeared to have improved the symptoms of depression (35). However, this study was limited by large inter-study variation. Thus, the relationship of isotretinoin treatment and depression still remains controversial. Dermatologist should still be cautious on the box warning while deciding to use isotretinoin for the treatment of acne. Patients too shall be warned about this warning and educate on the symptoms of depression before the treatment is commenced.

Our study had found no significant relationship between physician assessed acne severity with functional disability or psychological impact. Many studies had found similar findings (8,12,14,21) indicating that acne severity shall not be used to measure its effect on functional or psychological disability. Similarly, treatment shall be adjusted in accordance to not only the clinical severity, but also the quality of life or psychological symptoms. By emphasizing on patient's quality of life had been associated with better patients' satisfaction (29). Self-rated health severity had a better prediction on morbidity and mental health (14,30).

Our study is limited by its study design and small sample size which doesn't allow us to differentiate the cause and effect from simple association. Despite that, it does highlight that high amounts of patients with acne vulgaris are possibly psychological impaired and this shall be taken into account during the clinic visits, so that early intervention can be commenced. In the future, a larger scale, well-designed study should be conducted. Confounders (i.e socioeconomic status and educational background) that might contribute to psychiatric symptoms shall be taken into consideration. Patients would be best to be followed up with a diagnostic tool (i.e Mini- International Neuropsychiatric Interview (MINI)) to confirm the underlying psychiatric disorder. A follow up after treatment are commenced to demonstrate the reduction of DASS and MINI will demonstrate a clearer causality of acne vulgaris and psychological disorder.

CONCLUSION

In conclusion, although acne vulgaris is not life threatening, it is associated with functional disability as well as psychological comorbidities and should not be taken lightly. It is suggested that physicians who are treating acne vulgaris should take the opportunity to screen for psychological symptoms and refer to the respective team if necessary. Treatment for acne shall not be solely based on severity, but should be tapered in accordance its effect on functional disability and psychological impact as well.

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