

# Blemish on the Body, Scar on the Mind- Psychiatric Aspects of Acne Vulgaris: An Update

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## ABSTRACT

Acne Vulgaris (AV) is a chronic inflammatory disease of the pilosebaceous follicles. The development of acne and self-identity begins in adolescence, resulting in significant psychological stress and resultant psychiatric co-morbidities. Though acne may be transient, its effects on the mind might be long lasting.

**Keywords:** Acne Vulgaris, Stress, Psychiatric Morbidity, Quality of Life

## INTRODUCTION

“There is probably no single disease which causes more psychic trauma, more maladjustment between parents and children, more general insecurity and feeling of inferiority and greater sums of psychic suffering than does acne vulgaris” (Sulzberger and Zaidens).<sup>1,2</sup>

The brain and the skin develops from the embryonic ectoderm and are influenced by the same hormones and neurotransmitters, resulting in a close relationship between them.<sup>3</sup> While psychiatrists focus on the “internal indiscernible disease,” dermatologists focus on “external discernible disease”.<sup>4</sup>

Acne vulgaris (AV) is a chronic inflammatory disease of the pilosebaceous follicles, characterized by comedones, papules, pustules, nodules, and often scars.<sup>5</sup> It usually starts in adolescence and frequently resolves by the mid-twenties.<sup>6</sup> The estimated overall prevalence of AV around the world is 70-80% and is 56% among adolescents in the age group of 14-16 years.<sup>6,7</sup>

Although patients with cystic acne have prominent physical symptoms (pain, bleeding), patients with mild to moderate acne have been found to have significant psychiatric and social morbidity (Table 1).<sup>2</sup>

The appearance of acne during adolescence/puberty, a time when significant social and physical transformation along with the development of self-identity occurs, makes this disorder of particular concern. It affects patient's interpersonal relationships, self-evaluation, and daily performance.<sup>10</sup> Even a mild case of acne can be distressing.<sup>2</sup> Teenagers with acne are perceived by others as being shy, less socially active, more likely to be bullied, and less successful in terms of finding a job.<sup>10</sup> Studies on the quality of life in patients with AV suggests that it is at the same level as patients with other chronic medical conditions including asthma, epilepsy, diabetes, back pain and arthritis.<sup>1,10</sup> Various factors influence the suffering in these patients (illustrated in Table 2).

The possible relationship between acne and psychiatric disorders can take several forms<sup>10</sup>

1. Acne can be associated with major psychiatric disorders such as depression and anxiety disorders.
2. Psychological factors such as stress can exacerbate acne.
3. Emotional stress such as anger, embarrassment, and shame can occur secondary to acne.
4. Medications that are used for the treatment of acne can lead to psychiatric side effects including depression and suicidal thoughts. and
5. Psychotropic medications can induce acne.

## ROLE OF STRESS IN ACNE VULGARIS

Stress has been reported in 50% of patients affected by AV.<sup>1</sup> State of stress could be influenced by external factors (life events, social, work, or natural environment) and individual factors (attitudes, traits, temperament, past experiences, and needs), which are interconnected.<sup>3</sup>

Bondade et al studied the effect of stressful life events on acne, where they compared one hundred patients with acne and age-matched controls.<sup>3</sup> They found that life events do not affect the severity of the acne but may have a role in flaring of acne. Getting married or appearing for exams were the most common stressful life event, followed by change in eating habits, excessive use of alcohol by a family member, and transfer or change of working conditions, conflict with in laws or broken affair in the acne group when compared with controls. Studies among student population and multicentre epidemiological studies have also shown that psychological stress serve as a triggering factor for acne.<sup>1,13</sup> The number of acne lesions were noticed to increase within days after a stressful interview during which anger was intentionally induced.<sup>13</sup> A close chronological association (average latency=2days) has been noticed between emotional stress and exacerbation of their acne lesions.<sup>5</sup>

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Psychiatric Morbidity	Social Morbidity
Impaired self-image/self-esteem Depression (18%) Anxiety (44%) Active suicidal ideation (6%) Body dysmorphic disorder (8%) Anger and Frustration Permanent effects on personality	Decreased dating Decreased prospect in getting alliances for arranged marriage. Inter-personal problems with partner/spouse, friends and family members Decreased participation in sports Decreased eating out Impaired academic performance Increased unemployment

**Table-1:** Psychiatric and Social morbidity in Acne vulgaris<sup>1,6,8,9</sup>

Onset in adolescence	Adolescence is a time of significant physical, emotional, and social development.
Localization and visibility/facial distribution	Distribution of acne lesions is limited to areas with well-developed sebaceous glands including the face, back, chest, and upper arms. Unlike other dermatological conditions, which may be limited to areas covered by clothing, acne is apparent.
Chronicity of the skin disease	Though AV frequently decreases in the mid-twenties, it can be persistent in adulthood. Though the risk of depression is 63% in the first year of diagnosis, a positive correlation is found with the duration of acne. The presence of long-term disease results in an increased risk of scarring and disproportionate psychological distress.
Misperception regarding etiology	Belief that acne is a result of sunlight and diet consisting of milk, chocolates and food with high glycemic index. Belief that AV is a cosmetic problem, resulting from poor quality of face products → frequent visits to salon rather than a dermatologist. Belief that poor skin hygiene as a causative factor of acne(30%). Such feelings create a stigma that can lead to feelings of embarrassment, shame, and guilt in the afflicted.
Social emphasis on “appearance”	Media generated ideal of perfect skin makes adolescents feel that they failed to live up to the ideal of perfect, flawless skin portrayed in advertising and television. This leads to a self-perceived reduction in sexual attractiveness. Belief that poor physical appearance → Lowered opinion by others → Lower popularity. Lack of popularity may undermine self-esteem and self-confidence”
Sex	Women with acne are significantly more embarrassed about their skin disease compared with males.
Emotional/psychiatric comorbidities	Likelihood of experiencing perceived stigma was 3.19 times higher for those with acne compared to those without acne.
Childhood experiences	History of abuse-physical, sexual and emotional.

**Table-2:** Factors influencing the suffering in patients with AV<sup>1,6,7,12-15</sup>

Various theories have been implicated and include:

1. Psychoneuro-endocrinological and Psycho-immunological factors: Human sebocytes express functional receptors for corticotropin-releasing hormone(CRH), melanocortins, beta-endorphin, vasoactive intestinal polypeptide(VIP), neuropeptide Y and calcitonin gene-related peptide.<sup>1</sup> After ligand binding, these receptors modulate the production of inflammatory cytokines, proliferation, differentiation, lipogenesis and androgen metabolism in sebocytes. By means of their autocrine, paracrine and endocrine actions, these neuroendocrine factors appear to transmit centrally and topically induced stress to the sebaceous gland, ultimately affecting the clinical course of acne.<sup>1</sup> Increased corticosteroids and adrenal androgens, both hormones known to worsen acne, are released during periods of emotional stress.<sup>1,5</sup> Studies have also shown an increase of CRH expression in the sebaceous glands of acne-involved skin, compared to a low expression in normal skin. This upregulation of CRH expression in acne-involved skin may influence the inflammatory processes that lead to stress-induced acne lesions.<sup>1</sup> CRH also induces cytokines IL-6 and IL-11 production in keratinocytes, contributing to inflammation, which is regarded as a key component in the pathogenesis of acne.<sup>1</sup>
2. Peripheral nerves release the neuropeptide Substance P or Vasointestinal Peptide(VIP) in response to stress. Substance P stimulates the proliferation and differentiation of sebaceous glands and upregulates lipid synthesis in sebaceous cells.<sup>1,5</sup>
3. The increase in blood catecholamine levels secondary to psychosocial stress might play a role in further exacerbation of lesions.<sup>5</sup>
4. Brain-Gut-Skin theory (John Stokes and Donald Pillsbury)<sup>10</sup>: The lines of communication, according to this theory, may be directly or indirectly mediated by gut microbes and influence the severity of acne by several mechanisms including systemic effect on inflammation, oxidative stress, glycemic control, tissue lipids level, pathogenic bacteria, as well as levels of neuropeptides and mood-regulating neurotransmitters.

5. Psychological stress can slow down wound healing by up to 40% which can affect the repair process of acne lesions.<sup>1,13</sup>

## PSYCHIATRIC DISORDERS IN PATIENTS WITH ACNE

### COGNITIVE IMPAIRMENT

Neuropsychological assessments in patients with acne have demonstrated poor performance in verbal episodic memory, learning, working memory, and phonemic verbal fluency in comparison with controls.<sup>14</sup> The psychological distresses associated with AV (decreased self-esteem, impaired perception of self-image, embarrassment, fear of rejection, social withdrawal, and anger, restrictions in lifestyle, problematic family relations, excessive mental engagement in the acne lesions, and depressive and anxiety symptoms) may affect the performance in these tests.<sup>14</sup> ADHD, which is a frequent comorbidity in patients with AV, has also been associated with disturbances of cognitive functions, such as working memory, attention and executive functions, suggesting a relationship between acne and cognitive dysfunctions.<sup>14</sup> Initiation of treatment with isotretinoin have shown a significant improvement in the cognitive functioning, probably due to: (i) its impact on hippocampal function related with retinoid signalling, or (ii) alleviation of acne and consequently the reduction in psychological disturbances.<sup>14</sup>

Oxidative stress which plays a pivotal role in the pathogenesis of AV can also cause neuronal toxicity via DNA damage, lipid peroxidation, and reduction in neurotrophins leading to cognitive impairment.<sup>14</sup>

### SUBSTANCE USE DISORDERS

Alcohol abuse was seen in 6% of patients with AV.<sup>15</sup> Alcohol in large amounts increases the inflammatory reactivity of the skin and induce worsening of acne.<sup>16</sup>

The relationship of AV with nicotine is unclear, with some studies showing a positive, negative and no correlation. The positive effect of nicotine may be modulated by the nicotinic cholinergic receptors in the infundibulum of the pilosebaceous unit. Nicotine promotes infundibular epithelial hyperplasia and follicular plugging leading to AV.<sup>5</sup> Another mechanism implicated is the induction of phospholipase A2 dependent inflammatory pathway by the arachidonic acid and polycyclic aromatic hydrocarbons present in the cigarette smoke.<sup>16</sup> The negative correlation between smoking and acne is attributed to the anti-inflammatory action of nicotine on acne.<sup>16</sup>

Anabolic-Androgenic Steroids (AAS) stimulate and enlarge the sebaceous gland unit. In high doses, they increase sebum production, skin surface lipids and the population of Propionibacterium acnes. AAS can cause new-onset AV or exacerbate pre-existing AV into severe forms that are resistant to treatment, such as acne conglobata. With continued steroid use, acne vulgaris can progress to acne fulminans. Recalcitrant acne vulgaris in athletic patients should alert physicians to include anabolic steroid use in the

differential diagnoses.<sup>17</sup>

Studies have shown that several phytocannabinoids have sebostatic, lipostatic, antiproliferative, and anti-inflammatory effects, and has been implicated as a potential therapeutic agent for the treatment of AV.<sup>18</sup> Use of 3% cannabis extract cream decreases erythema in patients with acne.<sup>18</sup>

### PSYCHOTIC DISORDERS

A study done by Behnam et al showed that the most common psychological symptoms requiring treatment because of disturbed daily activities in the acne group were psychoticism (34.0%) and depression (31.1%) respectively.<sup>19</sup> Excess dietary vitamin A has been reported to induce psychosis.<sup>20</sup> Kepska et al reported a case of schizophrenia which presented with dermatitis artefacta. Isotretinoin initiated in this patient exacerbated the psychotic symptoms.<sup>19</sup>

Antipsychotic induced hyperprolactinemia can increase androgens and result in acne. Minocycline, which is used in the treatment of acne is thought to have a potential adjunctive role in the treatment of schizophrenia via caspase inhibition and downgrading nitric oxide induced signalling.<sup>21</sup>

### MOOD DISORDERS

Depressive symptoms associated with acne are often in reaction to body image concerns in teenagers and young people.<sup>5</sup> Studies have shown that depression is two to three times more prevalent in patients with acne than in the general population.<sup>11</sup> Most studies have shown the frequency of depression to be 13% -19% of cases, with few reporting higher frequencies (25.6% -31.1%).<sup>6,9,15</sup> In contrast to psoriasis, the severity of acne does not correlate with the severity of depression and even mild to moderate acne has been associated with depression, suicidal ideation and completed suicide.<sup>5,15</sup> The prevalence of suicidal ideation in adolescent and young adults with noncystic facial acne is reported to be 5.6%.<sup>5</sup> Therefore, depressed acne patients should always be assessed for suicide risk. A significant decrease of BDNF was noticed in patients with AV in comparison to control subjects.<sup>16</sup>

Some studies have shown that the severity of depression tends to escalate with increasing severity of AV and its scars but others have shown no relation of acne severity with depression.<sup>6</sup>

The frequency of Bipolar affective disorder was found to be 4% and dysthymia to be 33.3% in patients with AV.<sup>9,22</sup> The lithium-related acne is often resistant to usual treatments and require isotretinoin for resolution. However, isotretinoin is associated with increased risk of clinically significant exacerbation of mood symptoms, including suicidal ideation. This exacerbation arises in spite of concurrent usage of maintenance psychiatric medications.<sup>23</sup>

### ANXIETY DISORDERS

Adolescence is a period marked by an intense preoccupation with body image and related worries. Adolescents are extremely sensitive to issues of peer acceptance and have limited coping ability, which makes them vulnerable to develop Social phobia.<sup>10</sup> Acne can significantly interfere

in their social interactions, sports activities, academic performance and dating behaviour.<sup>5</sup>

The most common fears seen in patients with AV are “fear that acne will never cease(58%) and resultant scarring”.<sup>11</sup>

The overall frequency of anxiety disorders, generalised anxiety disorders and social phobia in patients with AV was found to be 12%, 6-50% and 2-45.7% respectively.<sup>9,10,15,22,23</sup>

The wide differences in the frequency in these various studies could be because of the use of different diagnostic or screening tools.

Patients with AV have demonstrated higher performance avoidance and total avoidance scores which caused significant disability in their occupational, social, and familial lives.<sup>10</sup>

The degree of social anxiety, social avoidance, generalized anxiety, depression, and negative automatic thoughts in these patients are significantly higher. These symptoms may be related to either acne itself or social anxiety or both.<sup>10</sup>

### OBSESSIVE COMPULSIVE DISORDER

A study by Agarwal et al found the frequency of OCD to be 2%.<sup>9</sup> Patients with acne may have obsessive thoughts about the oiliness of their face, thoughts or urges related to excessive picking or scratching of their normal skin or skin with minimal surface texture irregularities. The psychopathology may increase as well as be a partial cause of persisting acne, and a vicious cycle might ensue.<sup>1</sup> Patients with AV have been noticed to have higher MOCQ (Maudsley Obsessive Compulsive Questionnaire) scores for checking, slowness, and rumination than the healthy control subjects.<sup>24</sup>

### SOMATIZATION DISORDER

There are no reports on the frequency of somatization disorders. However a study by Hazarika et al showed that 75% of patients with AV reported of physical symptoms, with itching seen in 50% of these patients. 25% of cases of facial acne and 33% cases of acne in the back reported of itching.<sup>12</sup>

### DISSOCIATIVE DISORDERS

The frequency of Dissociative disorders in patients with AV was found to be 6%.<sup>9</sup> Patients may present with self-induced dermatoses (psychogenic excoriation) as an attempt at regulating emotions in the face of extreme stress. The skin is uniquely vulnerable to psychologic stress and reacts with sympathetically mediated responses (eg: pruritus), without significant opposing parasympathetic cutaneous response. High level of arousal leads to greater dissociation with numbing and relative anaesthesia of the skin resulting in self induced extensive lesions with sharp objects, with partial or no recollection of harm. Sustained arousal may be associated with rubbing or pricking in an attempt to self regulate i.e self soothe and decrease arousal.<sup>25</sup>

### BODY DYSMORPHIC DISORDER(BDD)

Recent studies have shown that 9% of patients with AV have BDD.<sup>8</sup>

Patients with BDD tend to be obsessed with the belief that there is something wrong with their looks and describe themselves as ugly, hideous, and deformed.<sup>1,8</sup> They spend

3-8hours/day with this preoccupation and have difficulty in resisting the same. Referential thinking, with beliefs that other people take special notice of how they look and worry about being mocked are common.<sup>8</sup> They perform repetitive behaviours such as camouflaging the perceived defects with clothes, makeup, hair etc. Other common behaviours include checking mirrors, excessive grooming, seeking reassurance, compulsive buying of clothes /makeup and tanning to cover perceived flaws. One third to half of the patients prick their skin with the intent to smooth out or improve their skin. They have poor or absent insight.<sup>8,26</sup>

Patient's self-evaluation of acne and dermatologist evaluations were found to be only 60% compatible, with lesions on the face evaluated as more severe.<sup>1,8</sup> Most patients would have sought nonpsychiatric treatments and those treated with isotretinoin were twice likely to have BDD.<sup>26</sup> Patients with a body dysmorphic disorder are at greater risk of suicide and 22% of patients with BDD would have at least attempted suicide prior to presentation.<sup>1,8,26</sup>

### POST TRAUMATIC STRESS DISORDER(PTSD)

Some PTSD patients, especially those with a history of sexual abuse, may repeatedly self-injure to enhance a deformity (eg, in some cases of acne excoriée), as they project their sense of “badness” and being “tainted” on their external body image. A larger number of PTSD patients may seek cosmetic procedures in an attempt to “fix” the body, albeit at an unconscious level, that has been “tainted” by the childhood abuse.<sup>26</sup>

### EATING DISORDERS

Recurrent Acne is considered to be one of the cutaneous signs of eating disorders. Eating disordered patients may go on restrictive diets in order to control their acne, since levels of androgens (primary stimulants of sebaceous gland activity) are lower in starvation.<sup>27</sup>

### SLEEP DISORDERS

Sleep promotes protective and restorative functions of the skin. Studies have suggested that acute sleep deprivation and poor sleep quality may impair the integrity of the skin. Sleep plays a strong regulatory role in hormonal (insulin-like growth factor-1, dehydroepiandrosterone sulfate) rhythms and affect sebum levels.<sup>28</sup>

Misery et al studied the relationship between AV and sleep disorders and found that there was no relationship with sleep disorders. However, these patients had a higher risk of difficulty falling asleep and feeling tired upon waking up.<sup>29</sup>

### HABIT AND IMPULSE DISORDERS: ACNE EXCORIEE

Habit and impulse disorders are estimated to occur in about 2% of dermatological patients.<sup>1,30</sup> Patients with psychogenic excoriation frequently have comorbid disorders such as obsessive-compulsive disorder, body dysmorphic disorder, substance abuse disorders, eating disorders, trichotillomania, compulsive buying, obsessive-compulsive personality disorder, and borderline personality disorder.<sup>1</sup>

The various subtypes of Acne excoriee include: (i) impulsive,(ii)compulsive,(iii) mixed.<sup>1</sup>

This condition is commonly seen in young females and psychoanalytic theories have been proposed as their underlying cause.According to the theory, these young women may have disturbed psychosexual adjustments, low self-esteem, and emotional lability.These patients excoriated their faces thereby reducing their attractiveness and thereby confirming their flawed self-image. This habit of excoriating the acne may go on for decades and serve as a method to relieve their stress. Suppressed aggression toward others became self-directed aggression and self-punishment.<sup>1,31</sup> Aggression was expressed psychosomatically as picking at acne lesions on the skin rather than through direct verbalization.<sup>1,30</sup>

The treatment is based on the subgroups: (i) patients with primary acne lesions, and (ii) patients without lesions. In both these groups, the females are in the habit of fiddling with their skin, consequently exacerbating the smallest of lesions. Tetracycline (1g/d) for six months is helpful in decreasing the lesions in the acne group, whereas trifluoperazine hydrochloride (5-30mg/d) or pimozide(4mg/d) along with psychotherapy is beneficial in the latter group.<sup>5</sup>

Kent and Drummond (1989) used habit reversal behaviour modification and Hollander (1959) described using post-hypnotic suggestion to achieve control of acne excoriée.<sup>1,31</sup>

## SEXUAL DISORDERS

A study by Hazarika et al showed that 5% of patients reported sexual difficulties due to acne, which was associated with the grade of acne. Sexual difficulties reported could be secondary to a self-perceived reduction in sexual attractiveness,disinterest secondary to acne associated anxiety or unwillingness to divulge personal information.<sup>12</sup> Misery et al found that AV was associated with lower sexual activity and 37.5% of patients had no sexual intercourse. They concluded that the self perceived attractiveness and self confidence, especially in women inhibited their sexual relationships.<sup>29</sup>

## PERSONALITY DISORDERS

A study by Malick et al. found that patients seeking cosmetic surgery commonly present with psychiatric disorders such as body dysmorphic disorder and cluster B personality disorders(narcissistic and histrionic personality disorder).<sup>4</sup> A study by Sarkar et al found that personality disorders were present in 29.2% of patients with severe acne, with obsessive-compulsive personality disorder (13.8%) being the most common followed by anxious (avoidant) personality disorder (9.2%), borderline personality disorder (3%), and mixed personality disorder (3%).<sup>4</sup>

## CHILDHOOD PSYCHIATRIC DISORDERS

Gupta et al studied the prevalence of ADHD in children with Acne to explore their relationship, as ADHD is relatively stable in adolescence and the onset of acne in adolescence.<sup>14</sup> A nationally representative sample of 5240 patients visiting for acne between 1995 to 2008 was examined and the

OR(Odd's Ratio) for ADHD in patients with acne versus all dermatology visits was 6.299. The OR for ADHD in atopic eczema versus all dermatology visits was 0.701. Comparison of the frequencies of ADHD in acne versus atopic eczema revealed an OR of 5.606, which suggested the high prevalence of ADHD in acne patients when compared to those with other skin conditions.<sup>14</sup>

However, Bilgic et al did not find any difference /association with ADHD and acne.<sup>32</sup>

Prenatal androgen levels are associated with autistic traits and several genes involved in steroidogenesis are associated with autism, Asperger's syndrome and /or autistic traits. Higher rates of androgen-related disorders like acne are reported in women with autism spectrum conditions.<sup>33</sup>

## ROLE OF MEDICATIONS

### MEDICATIONS USED IN THE TREATMENT OF ACNE

#### 1. Isotretinoin

Isotretinoin is the only nonpsychotic drug that ranks among the top 10 list of drugs in the FDA's database in terms of the number of reports on depression and suicidal attempts, whereas psychosis, mania, obsessive-compulsive disorder, and anxiety are rarely reported.<sup>5,34</sup>

The frequency of depressive disorders during the use of isotretinoin varies from 1% to 11%.<sup>7</sup> Retinoids are known to bind to retinoid receptors in the brain and exert effects on gene transcription. Retinoid receptors are concentrated in limbic areas which have been associated with depression, including the amygdala, prefrontal cortex, and hippocampus. Retinoids also influence neurochemical systems implicated in depression, particularly dopamine, and to some extent serotonin and norepinephrine.<sup>10,34</sup>

However, a large epidemiologic study has failed to demonstrate a higher prevalence of depression in patients treated with isotretinoin versus antibiotics.<sup>5</sup> Metanalysis by Li et al (2019) showed that isotretinoin improved depressive symptoms in patients with acne.<sup>7</sup>

A study by Ludot et al found a link between retinoid dysregulation and schizophrenia. He suggested that dysregulation by retinoids may be an important factor in the etiology of schizophrenia.<sup>23</sup>

Though isotretinoin was found to worsen obsessive doubting but successful treatment with oral isotretinoin was associated with improvement in depression, anxiety, and obsessive rumination symptoms in acne vulgaris patients.<sup>34</sup>

#### 2. Minocycline

Minocycline is a second-generation semi-synthetic tetracycline derivative,has been associated with depersonalization.<sup>35</sup> The pathophysiologic mechanism of depersonalization induced by minocycline is not clear but involves various hypotheses including hypersensitivity of the serotonin system, drug-related metabolic encephalopathy, substance-induced temporal disintegration, and panic-disorder-related etiology. It is important to recognize the signs of minocycline-induced depersonalization because it is

documented in the literature as a strong harbinger of multiple suicidal attempts in the affected individual<sup>35</sup>

### ROLE OF PSYCHOTROPIC DRUGS<sup>30</sup>:

Acneiform and pustular eruptions are seen in association with Carbamazepine, Lithium, Trazodone, Haloperidol and Aripiprazole.<sup>45</sup>

### COPING WITH ACNE

The immediate psychological consequences of acne are usually felt as soon as acne appear and include decreased self-esteem, poor self-image, self-consciousness and embarrassment. These are exacerbated by taunts, stigmatization and perceptions of being scrutinized or judged. Factors such as self-efficacy, compensation and camouflage can serve as attenuating factors.<sup>11</sup>

Successful acne therapies do not always lead to improvement in all emotional parameters.<sup>1</sup>

### QUALITY OF LIFE (QOL)

WHO defines QoL as the “individual's perception of their position in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns”.<sup>16</sup>

Acne-specific HRQoL (Health Related Quality of Life) assessment measures such as Acne Disability Index (ADI), Cardiff Acne Disability Index (CADI), Assessment of the Psychological and Social Effects of Acne APSEA, Acne Quality of Life AQOL, Acne-Quality of Life Index QOLI, Acne-QoL, and Acne Q4 have been associated to study the impact of acne while excluding irrelevant symptoms.<sup>16</sup>

Poor quality of QoL is associated with severity of facial, chest and back acne. Anger in these patients is associated with treatment non-compliance, treatment dissatisfaction and poor doctor-patient relationship.<sup>1</sup>

Factors correlated with quality of life include: social factors, emotional factors, personality type, presence of scarring and school-related or job-related problems.<sup>10</sup>

About 64-88% of patients report embarrassment/self-consciousness due to acne. This is directly linked to low self-image and self-esteem which leads to decrease in self-confidence.<sup>11,12</sup>

The degree of difficulty in daily activities (such as shopping, looking after home) is associated with the grade of acne and post-acne hyperpigmentation.<sup>12</sup> Unattractive appearance leads to embarrassment resulting in avoidance of social contact.<sup>11</sup>

About 68% of patients with AV avoid social gatherings during an episode of acute acne flare as they feel people stare at their acne and make them uncomfortable. This was more common in females.<sup>12,16</sup> Many patients with avoidance behaviour tend to have a permanent effect on personality (such as avoidant personality trait).<sup>11</sup>

About 21-57% of patients report a negative effect on work/study which correlated with the grade of acne. Patients constantly bother about their acne and facial appearance which affects their ability to concentrate on study/work. Most people feel that attractive patients were preferred

during job interviews.<sup>12</sup>

About 75% of patients report interpersonal problems. Patients report being constantly enquired about their acne, even teased by peers and relatives. Female patients report that acne reduced their prospect in getting alliances for an arranged marriage.<sup>12</sup>

However, the QoL may be improved by successful treatment of acne that considers providing both clinical and psychological improvement of patients.

### CONCLUSION

Though acne patients are not affected in terms of general health status, mobility, or life span, if the psychosocial effect of acne is not fully appreciated, acne could easily be dismissed as a “merely cosmetic” condition, especially in today's health-care climate.<sup>2</sup> Health professionals should have an empathetic attitude towards the emotional suffering of their patients.

‘Psychological burden’ of the disease was contrary to the popular belief in India which states that AV requires no treatment as it subsides with advancing age.<sup>6</sup> While it is true that AV does subside in the majority of patients, the remnant scars, however, can leave a deleterious effect on the psychology of these patients.

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