

Relationship between disease severity, perceived stress, and depression in patients with seborrheic dermatitis

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ABSTRACT

Objective: A significant proportion of patients with seborrheic dermatitis state that disease attacks are triggered by psychological stress and disease severity increases during stressful times. This study aimed to determine the relationship between disease severity and perceived stress and depression levels in patients with seborrheic dermatitis.

Patients and Methods: The patients' demographic characteristics, medical history, and Seborrheic Dermatitis Area Severity Index (SDASI), Perceived Stress Scale (PSS), and Beck Depression Inventory (BDI) scores were recorded, and the relationship between disease severity and the scale scores were statistically analyzed by comparing disease severity groups and using correlation analyses.

Results: The study included 120 patients with seborrheic dermatitis. The mean age of the patients was 29.5±8.2 years, and the female/male ratio was 49/71. According to disease severity, 66 (55%) patients were classified as mild, 30(25%) moderate, and 24 (20%) as severe seborrheic dermatitis. When the scale scores were evaluated, a significant positive correlation was found between SDASI and PSS ($r=0.767$, $p<0.001$), between SDASI and BDI ($r=0.663$, $p<0.001$), and between PSS and BDI ($r=0.687$, $p<0.001$).

Conclusion: A significant relationship was observed between disease severity, stress, and depression in patients with seborrheic dermatitis. There is a need for a multidisciplinary approach involving a dermatologist and psychiatrist in the follow-up and treatment of these patients.

Keywords: Depression, Disease severity, Seborrheic dermatitis, Stress

1. INTRODUCTION

Seborrheic dermatitis is a chronic recurrent skin disease that is commonly seen across the world and affects all age groups. It is considered that approximately 1-3% of the immunocompetent population is affected by this disease [1,2]. Although, the exact cause of the disease is not known, some risk factors, such as genetic predisposition, male gender, light skin color, generalized skin dryness, winter season, and proliferation of *Malassezia* species have been implicated in the etiology of the disease or triggering of attacks [3-6].

The effects of stress on emotional and physical health have been an interesting topic since ancient times [7,8]. Stress can be basically defined as the response to mental or physical pressure. Although, it is known that stress triggers many diseases, the

presence of a dermatological disease itself can also aggravate psychological stress and cause wide range psychiatric conditions, such as depression, anxiety, and somatoform disorders [9-11].

A significant proportion of patients with seborrheic dermatitis states that disease attacks are triggered by psychological stress and disease severity increases during stressful times [12]. The involvement of visible skin areas, such as the scalp and face may also cause psychiatric comorbidities in these patients. The aim of this study was to determine the relationship between disease severity and perceived stress and depression levels in patients with seborrheic dermatitis.

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2. PATIENTS and METHODS

Patients

The study included patients older than 18 years without any other dermatological or chronic disease, who were diagnosed with seborrheic dermatitis. The study was approved by Koc University Ethics Committee (approval number: 2019.415. IRB1.064) and written informed consent was obtained from all the participants. The patients' demographic characteristics (age, gender, and body mass index), disease duration, family history, factors that aggravated the disease, smoking status, and alcohol use were recorded.

Disease Severity

Disease severity was measured using the Seborrheic Dermatitis Area and Severity Index (SDASI) [13]. Nine anatomical regions were scored between 0 (absent) and 3 (severe) according to the severity of desquamation, erythema, and pruritus. The score of each area was multiplied by its specific constant (forehead, 0.1; scalp, 0.4; nasolabial, 0.1; eyebrow, 0.1; postauricular, 0.1; auricular, 0.1; intermammary, 0.2; back, 0.2; and cheek or chin, 0.1), and the sum of the scores was determined as the SDASI score. The patients were classified as having a mild disease if their SDASI score was 0-4.2, moderate disease if 4.3-8.4, and severe disease if 8.5-12.6.

The patients' stress levels were evaluated using the Turkish version of the five-point Likert-type Perceived Stress Scale (PSS), which has 14 items scored between 0 (never) and 4 (usually) [14]. A lower total score in PSS indicates low level of stress perception. The reliability and validity analyses of the Turkish version of PSS were previously undertaken by Eskin et al. [15].

The validated Turkish version of the Beck Depression Inventory (BDI) was administered to evaluate and determine the risk of depression in the patients [16,17]. BDI consists of 21 items, each scored from 0 to 3 depending on the patient's response, and a higher total score indicates greater depressive symptoms. The total score that can be obtained from this scale varies between a minimum of 0 and a maximum of 63. In the current study, the patients' depressive symptoms and risk of depression were categorized as follows: 0-9 points, normal state; 10-18 points, mild depression, 19-29 points, moderate depression, and 30-63 points, severe depression.

Statistical Analyses

The statistical analyses were performed using the Statistical Package for the Social Sciences version 26.0 (IBM SPSS Inc., Chicago, IL, USA). All the numerical variables were reported as mean \pm standard deviation, frequency, and percentages. As categorical variables, patient characteristics were compared using chi-squared test. Student's t-test and one-way analysis of variance were used for the comparison of quantitative variables. For non-normally distributed samples, the Mann-Whitney U or Kruskal-Wallis test was performed to compare the scores of the groups. The correlations between the scales were evaluated with the Pearson correlation analysis. Throughout the analyses, a p value of <0.05 was considered as statistically significant.

3. RESULTS

A total of 120 patients with seborrheic dermatitis were included in the study. The mean age of the patients was 29.5 ± 8.2 years, and 59% were male. According to disease severity, 66 (55%) patients were classified as having mild, 30 (25%) as moderate, and 24 (20%) as severe seborrheic dermatitis. BDI revealed normal scores in 85 (70.8%) patients, mild depression in 22 (18.4%), moderate depression in 9 (8.3%), and severe depression in 4 (3.8%). The family history of seborrheic dermatitis was positive in 34% of the patients. Patient characteristics are summarized in Table I. When evaluated in terms of disease localization, 65% of the patients had scalp and face involvement, 23% had only scalp involvement, and 12% had scalp, face, and trunk involvement. The factors that were reported to trigger attacks or increase disease severity were stress, certain food, lack of sleep, seasonal changes, alcohol consumption, nonmedical shampoos, and smoking (Table II). When the scale scores were evaluated, a significant positive correlation was found between SDASI and PSS ($r = 0.767$, $p < 0.001$), between SDASI and BDI ($r = 0.663$, $p < 0.001$), and between PSS and BDI ($r = 0.687$, $p < 0.001$) (Table III). However, there was no statistically significant correlation between the patients' scale scores and their age, disease duration, and body mass index (Table IV). Similarly, when the disease severity and PSS and BDI scores were compared between the genders, no statistically significant difference was observed ($p = 0.367$, $p = 0.667$, and $p = 0.838$, respectively).

Table I. Patient characteristics

Parameter	Value
Age, mean \pm SD	29.5 \pm 8.2
Gender, n (%)	
Female	49 (40.8%)
Male	71 (59.2%)
BMI, kg/m ² , mean \pm SD	23.4 \pm 3.7
Disease duration, months, mean \pm SD	64.7 \pm 65.9
SDASI, mean \pm SD	4.6 \pm 2.8
Disease severity, n (%)	
Mild	66 (55%)
Moderate	30 (25%)
Severe	24 (20%)
PSS, mean \pm SD	28.7 \pm 10.5
BDI, mean \pm SD	9.4 \pm 6.3

SD: Standard Deviation, BMI: Body Mass Index, SDASI: Seborrheic Dermatitis Area and Severity Index, PSS: Perceived Stress Scale, BDI: Beck Depression Inventory

Table II. Disease aggravating factors

Factor	n (%)
Stress	102 (85%)
Lack of sleep	38 (31.7%)
Certain food	56 (46.7%)
Alcohol consumption	22 (18.3%)
Smoking	15 (12.5)
Nonmedical shampoos	18 (15%)
Seasonal changes	34 (28.3%)

Table III. Correlation between scales

	r*	p
SDASI and PSS	0.767	<0.001
SDASI and BDI	0.663	<0.001
PSS and BDI	0.687	<0.001

*Pearson correlation coefficient, SDASI: Seborrheic Dermatitis Area and Severity Index, PSS: Perceived Stress Scale, BDI: Beck Depression Inventory

Table IV. Evaluation of the correlation between variables and scales

	SDASI		PSS		BDI	
	r	p	r	p	r	p
Age	0.009	0.925	-0.015	0.870	0.024	0.793
Disease duration	0.005	0.974	0.274	0.066	0.002	0.989
BMI	0.025	0.854	0.076	0.408	0.022	0.814

SDASI: Seborrheic Dermatitis Area and Severity Index, PSS: Perceived Stress Scale, BDI: Beck Depression Inventory, BMI: Body Mass Index

4. DISCUSSION

The aim of this study was to define the relationship between disease severity, stress and depression in patients with seborrheic dermatitis. At the end of the study, it was found that there were significant correlations between disease severity and stress, between disease severity and depression and between stress and depression in patients with seborrheic dermatitis.

Since, the skin is the primary organ in the perception of beauty, diseases that involve the skin can be defined as the most important and disturbing health problem from the perspective of patients. In addition to being an external barrier against the environment, the skin can also be a reflector for internal alterations, both physical and psychological. It is known that psychological stress affects many skin diseases, including psoriasis, atopic dermatitis, alopecia areata, pruritus, chronic urticaria, hair loss, vitiligo, and acne [18-22]. The hypothalamic-pituitary-adrenal (HPA) axis and sympathetic nervous system (SNS) play a role in individuals' general physiological response to stress. Recent studies suggest that the skin has peripheral equivalents of these two main pathways in responding to psychological stress (19). In addition to the HPA and SNS axes, hormones and mediators, such as corticotropin-releasing hormone, adrenocorticotropic hormone, catecholamines, cortisol, prolactin, and substance P can be secreted from keratinocytes, melanocytes, fibroblasts, mast cells, immune cells, sebaceous glands, and nerve endings when the skin is under stress. Bidirectional connections between the skin and brain have an important function in regulating the release of these hormones and neurotransmitters [18,23,24]. In addition, neuroendocrine axes influence the healing process and symptoms of skin diseases by stimulating a series of cascades, including cytokine production, cell migration, and inflammation [19].

In addition to stress triggering many diseases, the presence of the disease itself can also cause psychological stress or certain psychiatric diseases. Especially, in skin diseases involving visible anatomical regions, as well as symptoms like loss of self-confidence and social phobia, psychiatric comorbidities

such as anxiety, depression and somatoform disorders may accompany. Koo and Lee, who classified psychodermatological diseases, included seborrheic dermatitis in the category of psychophysiological disorders referring to the precipitation or exacerbation of a skin disease by psychological stress [25]. Many studies have shown the negative effect of stress on the severity of seborrheic dermatitis and frequency of disease attacks [12,26-29]. It is known that the quality of life is significantly affected in this chronic disease with recurrent attacks (30-33). In addition, there are studies showing an increase in anxiety and depression levels in direct proportion to the deterioration in the quality of life of patients with seborrheic dermatitis [30-32].

On completion of the current study, it was determined that as the severity of seborrheic dermatitis increased, the patients' perceived psychological stress levels and depression symptoms also increased. In a study by Aksoy et al., in which 50 patients with seborrheic dermatitis and 50 healthy controls were evaluated, the mean BDI scores of the patients were found to be 13.3, and a statistically significant difference was found compared to the control group [30]. In another study comparing 150 preoperative surgery patients and 150 patients with psychiatric disorders, it was reported that depressive patients had a high prevalence of seborrheic dermatitis [34]. Oztas et al., found an increased predisposition to depression in 30 patients with seborrheic dermatitis when compared with 30 healthy controls, although, the difference was not statistically significant [31]. In another study comparing a seborrheic dermatitis group with a healthy control group, it was shown that there was no significant difference in the risk of depression between the groups [35]. It is expected that skin diseases involving exposed body parts that are not covered by clothing during daily life psychologically affect patients to a greater extent. Misery et al., reported that patients with seborrheic dermatitis with facial involvement had higher depression scores, but there was no significant relationship between stress and depression [12]. In the current study, no significant relationship was observed between the anatomical localization of the affected seborrheic dermatitis areas and the depression levels of the patients.

It remains unclear whether stress aggravates seborrheic dermatitis or whether seborrheic dermatitis causes stress. It can be considered that stress not only triggers seborrheic dermatitis activation but is also involved in the disease cascade as a result of the chronic nature of the disease. Similarly, psychiatric comorbidities that may arise due to the psychological burden of the disease may vary depending on personal predisposition, genetics, and individual habits and experiences. In order to illuminate the complex relationship between the brain and skin, the patients' personal information, such as recent life events, social life, family relations, and sociocultural and economical status should be evaluated together with biomarkers and questionnaires.

According to the review of the literature, this is the first study to examine the severity of seborrheic dermatitis together with patients' perceived stress and depression findings and explore the relationship between these parameters. However, this study has certain limitations. First, stress and depression were

evaluated only with questionnaire-based scales. Receiving consultation from the psychiatry department and undertaking the follow-up of the patients in collaboration with a psychiatrist or psychologist would have optimized the assessment by confirming the diagnosis of psychiatric comorbidities. In addition, the inclusion of a control group and the measurement of inflammatory marker and hormone levels to evaluate the effects of stress on biochemical markers and HPA activity would have increased the power of the study.

Conclusion

The body and mind are entities that complement each other. Dermatological diseases can profoundly affect psychological well-being beyond the calculated disease severity scores and clinical findings. Therefore, the importance of mental well-being should be kept in mind in the management of seborrheic dermatitis and similar chronic skin diseases. Diagnostic questionnaires that can be applied in outpatient settings can help clinicians identify coexisting psychiatric disorders in patients with seborrheic dermatitis accompanied by stress and depressive symptoms. There is a need for a multidisciplinary approach involving a dermatologist, psychiatrist, and psychologist to create a successful treatment plan for these patients. To elucidate the skin-brain relationship in seborrheic dermatitis, further studies should be conducted with a large patient population, include a psychiatric examination and the measurement of biochemical markers, and perform comparisons between healthy controls and patients with other chronic dermatological diseases.

Compliance with the Ethical Standards

Ethical Approval: This study was approved by the Koc University Ethics Committee (Approval number: 2019.415.IRB1.064)

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Author contribution: ES and EKG: Study design, ES: data collection, data analysis, writing the article.

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