



Original Article

Affective temperaments profile as a predisposing factor for chronic plaque psoriasis

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Abstract

Introduction: Although there is a close relationship between psoriasis and psychological issues, including affective temperaments, few studies have addressed this association. This study aimed to assess the affective temperament profile in chronic plaque psoriasis patients.

Materials and Methods: This cross-sectional study was conducted at the dermatology outpatient clinic of Imam Reza Hospital, Mashhad, during 2018-2019. In the present study, 40 psoriasis patients and 40 healthy sex- and age-matched volunteers were participated. The research instruments included Psoriasis Area and Severity Index (PASI), Temperament Evaluation of the Memphis, Pisa, Paris, and San Diego-Auto questionnaire (TEMPS-A), Beck Anxiety Inventory (BAI), and Beck Depression Inventory-II (BDI-II). The t-test, Mann-Whitney, and Chi-square tests were used to compare nominal and categorical variables. Spearman's and Pearson's tests were used to evaluate correlations.

Results: Overall, 36 out of 80 (45%) were male. Depressive, cyclothymic, and anxious temperaments were significantly more prominent in the psoriasis group ($P < 0.001$), while the hyperthymic score was notably higher in the control group ($P = 0.023$). There was no significant correlation between disease severity (PASI score) and different affective temperaments. The duration of psoriasis involvement had moderate negative correlations with all affective temperaments ($P < 0.05$) except for hyperthymic temperament. The prevalence of anxiety (80% vs. 30%; $P < 0.001$) and depression (60% vs. 32.5%; $P = 0.009$) were significantly higher in psoriasis patients compared with the controls.

Conclusion: It seems that cyclothymic, depressive, anxious temperaments, as well as anxiety, and depression were more prevalent in psoriasis patients. However, these were not correlated with the disease severity.

Keywords: Anxiety, Depression, Psoriasis, Psychosomatic, Temperament

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Introduction

Psoriasis is a common multi-system inflammatory condition, often accompanied by

comorbidities such as arthritis, obesity, hypertension, cardiovascular disease, diabetes, ocular manifestations, and metabolic syndrome

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(1-4). It can present in diverse types; chronic plaque psoriasis is one of the most common subtypes (2). The severity of the disease may drastically vary over time for the same individual, but morbidity is very low (5,6). Since psoriasis presentations can dramatically impact physical appearances, affected patients may experience shame, social isolation, stigmatization, and poor self-image, leading to psychological distress (7,8). Nonetheless, anecdotal observations and research data suggest that daily environmental stressors or major life events affect the onset of psoriasis; e.g., stress may be regarded as a psychological risk factor of psoriasis, rendering it a psychosomatic condition (9-11)

Studies suggest that personality traits and coping styles are keys in one's adaptability to stress (12); speculations even exist on an association between personality scales and cortisol stress response patterns (13). The distinction between genetic traits and acquired character is not an easy feat; however, some methods have been vastly used by researchers as a way of stratifying these traits.

In this regard, the Temperament Evaluation of Memphis, Pisa, Paris, and San Diego-auto questionnaire version (TEMPS-A) is based on five temperaments (depressive, cyclothymic, irritable, hyperthymic, and anxious) serving to capture emotional, cognitive, psychomotor, and circadian personality traits which may be associated with major mood disorders (14,15). The association between TEMPS-A results and psoriasis has been studied in recent years, but the data is still insufficient, and the results of previous studies have been inconsistent (14,16); therefore, the issue still requires further investigation. We have previously shown that affective temperaments are associated with physiological conditions such as gestational diabetes mellitus (17) and hypertension (18).

We have also reported the link between certain affective temperaments and suicidality (19). It has been extensively shown that psoriasis patients are likely to be involved with depression, anxiety, and suicidality comorbidities (20,21); however, very few have tried to examine these conditions' cause/effect relationship with psoriasis. Psychological conditions such as anxiety and depression are linked to major mood disorders and play pivotal roles in psoriasis patients' response to treatment and symptom severity (22). As such, psoriasis patients suffering from these conditions could

benefit from adjunctive psychological therapy sessions. Considering the importance of etiological aspects of psychosomatic conditions on patients' clinical outcomes, this study aimed to assess the affective temperament profile of chronic plaque psoriasis patients in the dermatology outpatient clinic of Imam Reza Hospital, Mashhad- Iran. Since the available data on this matter is insufficient for a convincing conclusion, our findings may aid future investigators in better understanding psoriasis. The potential association between affective temperaments and psoriasis can help patients by uniting the efforts of dermatologists and psychiatrists since a purely symptomatic approach is suboptimal in psychosomatic conditions.

Materials and Methods

This cross-sectional study was conducted at the dermatology outpatient clinic of Imam Reza Hospital, Mashhad- Iran during 2018-2019. Informed written consent was obtained, and participants' confidentiality was ensured. This study received approval from the Ethics Committee of Mashhad University of Medical Sciences (Approval code: IR.MUMS.MEDICAL.REC.1397.129) and completely complied with the Declaration of Helsinki. Forty patients, aged 18-60 and able to read and write, with a confirmed psoriasis diagnosis based on physical examinations and histopathological evaluations, were included in this study via non-random convenience sampling (case group). Moreover, 40 healthy volunteers (control group) were recruited after being matched in terms of age and sex with the case group. Patients with a history of major psychiatric disorders before the incidence of psoriasis and those who did not fulfill the questionnaires completely were excluded from the study.

Research instruments

A) *Demographic Checklist*: Demographic data, including age, sex, marital status, employment status, and education, were documented using appropriate checklists. Clinical characteristics of the participants, including a family history of psoriasis, disease duration, current medications, substance abuse, psychiatric history, and physical illness history, were also recorded.

B) *The Psoriasis Area and Severity Index (PASI)*: To assess the severity of psoriasis, a

dermatologist calculated PASI based on the following formula: PASI = [Erythema (0-4) + Induration (0-4) + Desquamation (0-4)] × area of the affected skin (%). The affected area was estimated based on the following criteria:

- 9% for the head
- 9% for each arm
- 18% for each side of the trunk
- 18% for each leg
- 1% for the genital area

The PASI score of zero indicates a healthy individual, while 72 denotes the most severe case of psoriasis.

C) Temperament Evaluation of Memphis, Pisa, Paris, and San Diego-auto Questionnaire version (TEMPS-A): The translated and validated TEMPS-A was given out to both study groups. This auto-questionnaire included 110 yes-no items, evaluating five affective temperaments: depressive (items 1-21), cyclothymic (items 22-42), hyperthymic (items 43-63), irritable (items 64-84), and anxious (items 85-110) (23). The validation of TEMPS-A has been confirmed with a Cronbach α varied from 0.67 for the depressive and 0.83 for the anxious (24). Moreover, validation of a short Persian-language version of the TEMPS-A has been confirmed in one study by Derakhshanpour et al. (25).

D) Beck Anxiety Inventory (BAI): The BAI self-report tool was used to evaluate anxiety with 21 questions, each having a score range of 0-3. Cumulative scores of 0-7 indicated minimal anxiety, 8-15 represented low anxiety, 16-25 showed moderate anxiety, and 26-63 indicated high anxiety levels (26). The reliability ($r=0.72$), validity ($r=0.83$), and internal consistency (Alpha= 0.92) of the Persian version of BAI have been confirmed by Kaviani et al. (27).

E) The Beck Depression Inventory-II(BDI-II): It is a self-report depression tool, which also

included 21 questions (0-3), was used to evaluate the severity of depression in participants. Cumulative 0-13 were regarded as minimal depression, 14-19 indicated low depression, 20-28 showed moderate depression and 29-63 were considered severe depression (28). The reliability of the Persian version of the BDI-II self-report depression tool has been confirmed by Zarghami et al. (29).

Considering the results of our previous studies (17,18) and assuming a potential data loss of 20%, we estimated a required sample size of 20. However, we recruited 40 participants for each group to improve the overall sample size for the study. Data were analyzed using SPSS version 23 (IBM Statistics, Chicago, IL, USA). Independent samples t-test and Mann-Whitney test were used to compare parametric and nonparametric variables. The Chi-square test was used to compare categorical variables. Correlations were evaluated using Spearman's and Pearson's tests. $P < 0.05$ was considered statistically significant in all tests.

Results

Overall, 80 cases were studied, of whom 36 (90.0%) were male. Of the 80 participants, 40 (50.0%) had a definitive psoriasis diagnosis (case group), and the rest were sex- and age-matched controls. Table 1 compares the demographic and clinical features of the two groups. Eight control subjects had chronic ailments other than psoriasis, and two had a history of referring to a psychiatrist. However, none of them were previously hospitalized in psychiatric institutions. The demographic data, including age, sex, education, marital status, employment, and baseline clinical features, are depicted in Table 1; however, no statistical significance was observed between the two groups regarding any of these features ($P > 0.05$).

Table 1. Comparison of the demographic and clinical features of the case and control groups

| Feature | Case (n= 40) n (%) | Control (n= 40) n (%) | Total (n= 80) n (%) | P value ¹ |
|--------------------------|--------------------|-----------------------|---------------------|----------------------|
| Sex | Male | 18 (45.0) | 36 (45.0) | 0.589 |
| | Female | 22 (55.0) | 44 (55.0) | |
| Age (years) | 18-30 | 18 (45.0) | 30 (37.5) | 0.301 |
| | 31-50 | 12 (30.0) | 30 (37.5) | |
| | 51-60 | 10 (25.0) | 20 (25.0) | |
| Marital status | Single | 10 (25.0) | 28 (35.0) | 0.085 |
| | Married | 26 (65.0) | 48 (60.0) | |
| | Widowed | 2 (5.0) | 2 (2.5) | |
| | Divorced | 2 (5.0) | 2 (2.5) | |
| Education (years) | ≤12 | 6 (37.5) | 8 (10.0) | 0.218 |
| | >12 | 10 (62.5) | 20 (25.0) | |
| Job status | Unemployed | 14 (35.0) | 28 (35.0) | 0.115 |
| | Employed | 22 (55.0) | 48 (60.0) | |
| | Retired | 4 (10.0) | 4 (5.0) | |
| Past medical history | 8 (21.1) | 8 (20.5) | 16 (20.0) | 0.587 |
| Substance abuse | 20 (50.0) | 22 (55.0) | 42 (52.5) | 0.121 |
| Past psychiatric history | 3 (7.5) | 2 (5.0) | 5 (6.2) | 0.500 |
| Psychiatric medication | 2 (5.0) | 0 (0.0) | 2 (2.5) | 0.247 |

I. Chi-square or Fisher's exact test

According to Table 2, the two groups showed a significant difference in terms of the total BAI ($P < 0.001$) and BDI-II ($P = 0.009$) scores, such that the prevalence of minimal to low states of depression and anxiety were higher in the control group. In comparison, the prevalence of moderate to severe forms of depression and anxiety was higher in the psoriasis group.

In terms of affective temperaments, higher scores for depressive, cyclothymic, and anxious temperaments were found in the psoriasis group ($P < 0.001$), while hyperthymic temperament scores were higher in the control group ($P = 0.023$). The irritable temperament was not notably different across the groups (Table 2).

Table 2. Comparison of the outcomes between the case and control groups

| Feature | | Case (n= 40) | Control (n= 40) | P value |
|------------------------|-------------|------------------|-----------------|------------------------|
| BAI, n (%) | Minimal | 8 (20.0) | 16 (40.0) | < 0.001 ^I |
| | Low | 0 (0.0) | 12 (30.0) | |
| | Moderate | 22 (55.0) | 6 (15.0) | |
| | High | 10 (25.0) | 6 (15.0) | |
| BDI-II, n (%) | Minimal | 9 (22.5) | 22 (55.0) | 0.009 ^I |
| | Low | 7 (17.5) | 8 (20.0) | |
| | Moderate | 9 (22.5) | 5 (12.5) | |
| | Severe | 15 (37.5) | 5 (12.5) | |
| TEMPS-A, Mean \pm SD | Depressive | 12.30 \pm 4.59 | 6.32 \pm 3.69 | < 0.001 ^{II} |
| | Cyclothymic | 11.17 \pm 4.45 | 5.87 \pm 4.99 | < 0.001 ^{III} |
| | Hyperthymic | 7.40 \pm 4.87 | 9.87 \pm 4.66 | 0.023 ^{II} |
| | Irritable | 6.83 \pm 4.62 | 5.83 \pm 4.73 | 0.548 ^{III} |
| | Anxious | 13.87 \pm 5.62 | 5.30 \pm 5.14 | < 0.001 ^{III} |

BAI: Beck Anxiety Inventory; BDI-II: Beck Depression Inventory-II; TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris and San Diego-autoquestionnaire; SD: Standard Deviation. I. Chi-square test II. Independent t-test III. Mann-Whitney test

Inter-variable correlations

Regarding the correlation of affective temperaments with each other, Pearson's and Spearman's tests revealed that all temperaments were positively correlated except with the hyperthymic temperament. The depressive temperament was positively correlated with the cyclothymic ($r = 0.673$, $P < 0.001$), irritable ($r = 0.525$, $P = 0.008$), and anxious ($r = 0.753$, $P < 0.001$) temperaments, cyclothymic temperament was correlated with the irritable ($r = 0.445$, $P = 0.030$) and anxious ($r = 0.792$, $P < 0.001$) temperaments, and the irritable temperament was associated with the anxious ($r = 0.740$, $P < 0.001$) temperament (Table 3). Furthermore, Table 3 shows that

according to Pearson's test, the duration of psoriasis involvement was negatively and moderately correlated with all affective temperaments except hyperthymic. All affective temperaments, except hyperthymic, were also positively correlated with total BDI-II and BAI scores ($P < 0.05$); these correlations were the strongest for cyclothymic ($r = 0.757$ with BAI; $r = 0.728$ with BDI-II) and anxious temperaments ($r = 0.747$ with BAI; $r = 0.668$ with BDI-II). Regarding disease severity, the PASI score showed no significant correlation with BAD-II and BAI scores ($P = 0.798$ and 0.928 , respectively). The PASI score was also not correlated with any of the affective temperaments (Table 3).

Table 3. Inter-variable correlations between affective temperaments and clinical features

| Variable | Depressive | Hyperthymic | Cyclothymic | Irritable | Anxious |
|------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Hyperthymic ^I | P= 0.192 r= -0.147 | - | - | - | - |
| Cyclothymic ^{II} | P< 0.001 r= 0.673 | P= 0.105 r= 0.260 | - | - | - |
| Irritable ^{II} | P= 0.008 r= 0.525 | P= 0.055 r= 0.396 | P= 0.030 r= 0.445 | - | - |
| Anxious ^{II} | P< 0.001 r= 0.069 | P= 0.291 r= 0.069 | P< 0.001 r= 0.792 | P< 0.001 r= 0.740 | - |
| BAI ^I | P< 0.001 r= 0.677 | P= 0.674 r= -0.069 | P< 0.001 r= 0.757 | P< 0.001 r= 0.658 | P< 0.001 r= 0.747 |
| BDI-II ^I | P< 0.001 r= 0.679 | P= 0.374 r= -0.144 | P< 0.001 r= 0.728 | P< 0.001 r= 0.585 | P< 0.001 r= 0.668 |
| PASI ^I | P= 0.939 r= -0.012 | P= 0.659 r= 0.072 | P= 0.932 r= 0.014 | P= 0.487 r= 0.149 | P= 0.586 r= 0.089 |
| Duration of psoriasis ^I | P= 0.014 r= -3.85 | P= 0.575 r= -0.091 | P= 0.001 r= -0.493 | P= 0.008 r= -0.525 | P= 0.003 r= -0.462 |

BAI: Beck Anxiety Inventory; BDI-II: Beck Depression Inventory-II; PASI: Psoriasis Area and Severity Index. I. Pearson's correlation test II. Spearman's correlation test

Discussion

We evaluated the association between psoriasis and affective temperaments to better understand the possible etiological significance of personality traits during this disease. Our results indicate a higher prevalence of cyclothymic, anxious, and depressive temperaments among psoriasis patients; however, the severity of the disease (based on the PASI score) had no significant association with affective temperaments. Furthermore, we found that the duration of the disease was negatively correlated with all temperaments except hyperthymic.

Regarding anxiety and depressive symptoms, we also found higher severities of depression and anxiety in the psoriasis group. Interestingly, we also observed that the control group demonstrated significantly higher scores for hyperthymic temperament compared with the psoriasis group, which can justify the higher level of depression in the psoriasis group, as hyperthymic temperament has been shown to have a protective role against depression (30).

Several other studies have used TEMPS-A to assess psoriasis patients, and the results have mostly aligned with our findings. Pancar Yuksel et al. have reported that psoriasis patients have a greater tendency for depressive, cyclothymic, and anxious temperaments (14). Furthermore, they compared the control group with psoriasis patients using the Perceived Stress Scale (PSS) and found greater scores in the affected group. Since we also found higher levels of anxiety and depression in these patients based on the BAI and BDI-II scores, it may be valid to appoint the onset of psoriasis to the intensified stress levels associated with cyclothymic, depressive, and anxious temperaments. In 2013, a similar study was conducted on 65 psoriasis patients, and the results indicated that almost 70% of the patients had hyperthymic temperaments. Moreover, patients with hyperthymic, depressive, anxious, and irritable temperaments were found to have diminished responses to therapy and a tendency to intensify the symptoms (16). Some Turkish researchers have also laid out supporting evidence and evaluated the association of psoriasis with Temperament and Character Inventory (TCI). Due to the ethnic similarities between our samples, it is not surprising that we found their results to align with our current findings regarding the association between

psoriasis and depressive and anxious temperaments (31).

Nonetheless, Litaïem et al., in their study, reported that, compared with control participants, psoriasis patients demonstrated no difference in terms of TEMPS-A results. Furthermore, they also reported no difference in the severity of anxiety based on BAI scores, and they only found the irritable temperament to be negatively correlated with the disease duration (32). The investigated population was recognizably different from our study population, and they did not report the severity of the disease, which may have had a role in finding these seemingly different results.

On the one hand, it has been demonstrated that almost 88% of psoriasis cases occur following a stressful life event (33). The association between psoriasis and psychological conditions such as depression has been reported in the literature (34). This aligns with our results regarding the higher prevalence of severe depression in psoriasis patients. On the other hand, it has been shown that some affective temperaments predispose individuals to affective disorders such as major depressive disorder (35). Altogether, considering the results of our study, we can suggest an interrelation between psoriasis, affective temperaments, and psychiatric disorders, which can be possible through neurological pathways, affecting the immunological responses involved in the pathogenesis of psoriasis. Considering the general significance of genetics in psoriasis (36), one of the limiting factors of our study was limited population to a single geographical region, which can reduce the generalizability of our outcomes to a wider population. Furthermore, due to the design of our study, evaluating the possible association between the affective temperaments and treatment course in psoriasis patients was not possible. Nonetheless, our study was among the few in this area with matched controls to minimize bias. Further large-scale studies are still required to provide enough data for systematic reviews or meta-analyses that can conclude.

Conclusions

Our results support that psoriasis is associated with certain affective temperaments in the involved individuals. Particularly, cyclothymic, depressive, and anxious temperaments were more frequently observed in psoriasis patients

than in healthy controls. Furthermore, the prevalence of anxiety and depression was higher in psoriasis patients, even though these are not correlated with the severity of the disease. In this regard, routine psychological evaluation of psoriasis patients is signified as an important tool in devising effective treatment plans for these patients.

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