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PSYCHOLOGICAL STRESS AND ITS ROLE IN THE COURSE OF PSORIASIS: A REVIEW OF THE LITERATURE

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ABSTRACT

Psoriasis is a chronic inflammatory skin disease whose course is significantly modulated by psychosocial factors, especially stress. Increasing evidence suggests that stress can both initiate the first symptoms and exacerbate disease activity and promote recurrence. The mechanisms underlying this phenomenon include activation of the hypothalamic-pituitary-adrenal axis, dysregulation of the neuroimmunological response, and increased expression of proinflammatory cytokines, which maintain chronic skin inflammation. The aim of this review was to summarize the current knowledge on the relationship between stress and psoriasis and to evaluate the effectiveness of psychological interventions and stress reduction techniques as adjuncts to standard dermatological treatment.

A review of the literature shows that interventions such as cognitive behavioral therapy (CBT), mindfulness programs (MBSR/MBCT), relaxation training, and biofeedback consistently improve mental well-being (including reducing anxiety and depression) and quality of life. Some studies have also reported a beneficial effect on the severity of skin changes. Furthermore, attention has been drawn to the importance of coping styles and social support, which can modify the response to stress and the course of the disease.

The limitations of the available studies include small sample sizes, heterogeneity of protocols, and short follow-up periods, which make it difficult to compare results and assess the durability of effects. In the future, well-designed randomized trials with longer follow-up periods are needed, as well as research on neurological and immunological biomarkers that will facilitate objective assessment of efficacy. The integration of psychological components into the biopsychosocial model seems to be a reasonable direction for optimizing the care of patients with psoriasis.

KEYWORDS

Psoriasis, Stress, Psychoneuroimmunology, Quality of Life, Psychological Interventions, Mindfulness

CITATION

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Introduction

Psoriasis is a chronic, recurrent inflammatory skin disease of autoimmune origin, affecting 1 to 3% of the world's population. It is characterized by the occurrence of erythematous-exfoliative lesions that can affect various areas of the body, and its clinical course is variable, ranging from mild to severe, extensive forms of the disease. Despite the complex and multifactorial pathogenesis of psoriasis, in which genetic, immunological, and environmental factors play a key role, contemporary research increasingly focuses on the importance of psychological stress as a significant factor modulating the dynamics and clinical course of this dermatosis.

Numerous studies have shown that stress can both initiate the first symptoms of psoriasis and lead to its exacerbation. In some patients, there is a clear temporal relationship between exposure to stressful situations and the appearance or worsening of skin lesions. The mechanisms of this phenomenon are explained, among other things, by the activation of the hypothalamic-pituitary-adrenal (HPA) axis, increased secretion of cortisol and catecholamines, as well as modulation of the immune response, including increased secretion of pro-inflammatory cytokines (including TNF-α, IL-6, IL-17). In addition, stress affects the functioning of the skin's nervous system, disrupting the regulation of neuropeptides, which may promote the development and maintenance of chronic inflammation.

The significance of stress in psoriasis is not limited to its role in the pathogenesis and exacerbation of the disease. Patients struggling with chronic skin lesions often experience a reduced quality of life, feelings of shame, social isolation, and symptoms of depression and anxiety. Psoriasis often creates a vicious cycle: psychological stress exacerbates skin symptoms, and visible skin changes in turn increase feelings of stress.

In recent years, there has been growing interest in psychological interventions and stress reduction techniques as part of supportive treatment for psoriasis. Programs based on cognitive behavioral therapy (CBT),

relaxation training, mindfulness (MBSR), and biofeedback have a beneficial effect on patients' mental well-being and, in some studies, also on the severity of skin symptoms. Although they are not considered primary methods in psoriasis therapy, their role in a holistic approach to the patient is becoming increasingly appreciated.

The aim of this paper is to review the current literature on the relationship between stress and psoriasis, with particular emphasis on the biological mechanisms of this phenomenon and the effectiveness of psychological interventions in the treatment of this disease.

Materials and methods

This article was developed as a narrative review aimed at presenting the current knowledge on the role of psychological stress in the pathogenesis and course of psoriasis and assessing the effectiveness of psychological interventions and emotional stress reduction techniques in the treatment of this disease. The source material included scientific publications provided to the authors in full text form, mainly from peer-reviewed journals, and obtained from reliable sources such as PubMed, ScienceDirect, SpringerLink, Wiley Online Library, Core.ac.uk, as well as archives of dermatological and psychological journals.

The time frame of the searched publications mainly covered the last 20 years, and the inclusion criteria were based on the following assumptions:

1. Studies involving people diagnosed with psoriasis (both adults and adolescents).
2. Works analyzing the relationship between stress and the occurrence or exacerbation of psoriasis symptoms.
3. Studies evaluating the impact of psychological interventions or relaxation techniques on clinical parameters of the disease, including the PASI index, quality of life, and perceived stress levels.

The review excluded publications in the form of comments, letters to the editor, case reports, and conference reports. However, it included randomized controlled trials, prospective studies, observational studies, as well as previous narrative and systematic reviews.

The analysis process involved a multi-stage selection process. First, a preliminary assessment of titles and abstracts was carried out to exclude items not directly related to the topic of the study. Next, the full texts of the selected articles were analyzed in terms of: the purpose of the study, the characteristics of the study population, the assessment tools used (e.g., Skindex-29, PASI, HAD scale), type of intervention (e.g., mindfulness-based stress reduction - MBSR, cognitive behavioral therapy - CBT, relaxation training, biofeedback), and observation time [4][8].

Each publication was subjected to a critical analysis of methodological and substantive quality. The results of the studies were grouped thematically, which made it possible to discuss separately the biological mechanisms linking stress to psoriasis, the impact of stress on patients' quality of life, and the effects of psychological interventions and relaxation techniques on the clinical condition of patients.

No statistical analysis or assessment of systematic error risk was performed, as the aim of the study was to conduct a qualitative and synthetic analysis of the available data, rather than a quantitative meta-analysis.

The narrative review method used allowed for the flexible inclusion of studies with a variety of designs and assessment tools, which is important in the case of an interdisciplinary issue such as the psychosomatic dimension of psoriasis.

Results

I. Stress as a trigger and exacerbating factor in psoriasis

In the majority of the analyzed studies, patients reported that psychological stress had a significant impact on the onset or exacerbation of skin lesions. In Verhoeven's study [1], conducted on a group of 62 patients with psoriasis, stress was identified as the main factor triggering disease recurrence. At times of peak daily stress, patients reported increased itching and a more severe course of the disease compared to symptoms occurring during periods of lower stress.

Researchers also emphasize that stressful life events, such as job loss or the death of a loved one, can trigger the first episode of psoriasis [3]. It has also been noted that patients with previous mood disorders had a stronger skin reaction to stress [1]. Patients reported not only a temporal relationship between stress and exacerbations of symptoms, but also a subjective feeling of loss of control over the disease during times of high psychological stress [4].

A prospective study involving 101 patients showed that as many as 60% of patients experienced exacerbations immediately after stressful life events. The authors also noted that individuals described as “highly

reactive to stress" were characterized by more frequent relapses and a more severe course of the disease [12]. In a six-month observation, it was noted that psychological stress combined with low levels of social support and deficits in emotion regulation was one of the most significant predictors of psoriasis exacerbations [12].

The correlation between stress and disease severity was also confirmed in a group of 141 patients, and it was found that high levels of perceived stress were associated with both poorer clinical status and increased psychological distress. Importantly, most patients directly identified stress as a factor responsible for the deterioration of their skin condition [8]. In addition, subsequent studies highlighted the importance of coping styles-people who used avoidance and emotional strategies were more likely to experience more severe relapses. More than half of the patients surveyed considered stress to be the main factor causing exacerbations of the disease [13].

II. Biological mechanisms underlying this relationship

From a pathophysiological perspective, stress affects the immune system by activating the HPA axis. As a result of its activation, there is an increase in the concentration of cortisol, a hormone with anti-inflammatory properties. However, with prolonged exposure to stress, the effect of cortisol is weakened, which can lead to the perpetuation of inflammatory processes in the skin. Disruption of HPA axis regulation also contributes to an imbalance in the functioning of the immune system. An experiment was conducted with 62 patients with psoriasis, in which the cortisol response to a stress stimulus (which was assessed on the basis of the patient's self-assessment) was examined. The results showed that patients with severe disease had significantly higher cortisol levels after exposure to the stressor than those in the control group. This indicates HPA axis hyperactivity in psoriasis patients and its possible role in maintaining inflammation [5].

Under conditions of chronic mental stress, the activity of immune cells increases, especially Th1, Th17, and Th22 lymphocytes, which are responsible for the secretion of pro-inflammatory cytokines such as interleukin 6 (IL-6), interleukin 17 (IL-17), tumor necrosis factor alpha (TNF-α), and interleukin 23 (IL-23). The excessive presence of these mediators contributes to excessive proliferation of epidermal cells and increased inflammatory infiltration, characteristic of psoriasis [6,37].

Another important factor is the imbalance between pro-inflammatory and anti-inflammatory cytokines. In people with psoriasis, there is reduced activity of interleukin 10 (IL-10), which normally limits inflammatory responses. The absence of this "inhibitory" role leads to an intensified immune response, which contributes to the persistence of disease lesions [7]. These results are consistent with the current model of psoriasis immunopathogenesis, in which the IL-23/Th17 axis plays a key role in maintaining chronic inflammation and increased keratinocyte proliferation.

III. Quality of life and mental functioning of patients

A review of the literature clearly indicates that psoriasis has a negative and multidimensional impact on the quality of life of those affected by the disease. The severity and location of skin symptoms, as well as the chronic nature of the disease, negatively affect patients' physical and emotional condition, their social interactions, and their professional activity, which significantly reduces their quality of life. In a cross-sectional study involving 141 people from two institutions, as many as 61% of respondents experienced anxiety related to the disease and the fact that it increases the severity of the disease. This was associated with a poorer quality of life and increased levels of depression [8]. The results also showed a correlation between the severity of skin symptoms (assessed according to PASI) and the severity of mental symptoms. Women and young people reported higher levels of emotional stress related to the disease. Another study [2], based on an analysis of data from a database of over 146,000 patients, showed that people with psoriasis had a much higher risk of depression and a higher likelihood of suicide attempts compared to the general population.

In turn, a study using the Skindex-29 tool to assess the impact of psoriasis on daily life. The difficulties most frequently reported by patients concerned the social sphere-42% of respondents reported avoiding public places due to skin changes, and over 50% felt ashamed and embarrassed. A high percentage of respondents also reported a deterioration in sexual functioning and difficulties in intimate relationships [9]. It is worth noting that quality of life assessment tools such as DLQI and Skindex-29 are routinely used in dermatology, confirming the clinical significance of the psychological and social consequences of psoriasis.

IV. Effectiveness of psychological interventions and relaxation techniques

a) Relaxation training

Eight-week relaxation programs led to significant clinical improvement in approximately 40% of patients (decrease in PASI), while reducing anxiety and depression and improving sleep quality and interpersonal functioning [14].

b) Mindfulness and meditation (MBSR/MBCT)

It has been shown that in patients combining participation in the MBSR program with UVB phototherapy, a 75% reduction in skin lesions occurred after an average of 48 sessions. In comparison, the control group needed 97 sessions to achieve the same degree of remission, suggesting a potential synergistic effect of both therapeutic methods [15].

More recent studies also point to benefits: a systematic review of RCT studies on mindfulness and meditation showed that 5 out of 6 exercises resulted in an improvement in the saPASI score after 8-12 weeks of intervention, as well as a positive impact on quality of life [16].

Preliminary studies have shown that a several-week mindfulness-based therapeutic program (MBCT) was effective in reducing the subjectively assessed severity of psoriasis symptoms and improving patients' quality of life. Importantly, these results were achieved despite the lack of a statistically significant effect on the PSS (Perceived Stress Scale) and HAD (Hospital Anxiety and Depression Scale) scales [17]. However, another study confirmed a significant improvement in mental health and quality of life after MBCT, further supporting its potential as an adjunctive therapy [18].

c) CBT and biofeedback

The combination of cognitive behavioral therapy (CBT) with biofeedback as a supplement to UVB phototherapy led to a significant improvement in the PASI index, which translated into a PASI75 reduction in 65% of patients. These results were significantly better than in the control group, which achieved a score of 15%. This also translated into an improvement in quality of life and a reduction in minor mental disorders [19]. In half of the randomized studies, CBT effectively reduced psoriasis symptoms, anxiety, and depression, and almost all showed an improvement in quality of life, especially in groups with more severe mental health problems [14]. This emphasizes that precisely targeted interventions can enhance the effectiveness of dermatological therapy.

d) Online interventions and e-CBT

One study presented an online version of CBT (eTIPs), which improved anxiety and quality of life in patients with psoriasis, although without significant changes in the severe symptom index (saPASI) [20].

Discussion

The results of the review confirm the important role of stress as a factor modulating the course of psoriasis. Both prospective and observational studies confirm that stress, whether caused by a sudden, intense life event or persistent in a chronic form, can exacerbate symptoms or promote recurrence [8,11,12]. In people who perceived stress as a triggering factor, elevated levels of depressive symptoms, increased anxiety, and a feeling of less control over their health were more frequently observed.

From a pathophysiological point of view, these observations can be explained by neuroendocrine and immunological mechanisms. Activation of the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system in response to stress leads to increased secretion of cortisol and catecholamines [33]. Under conditions of chronic stimulation, the regulatory mechanism is disrupted, resulting in increased concentrations of proinflammatory cytokines, including TNF-α, IL-17, and IL-23, and activation of Th1 and Th17 lymphocyte subpopulations [35,36]. These processes play a key role in maintaining chronic inflammation and the increased keratinocyte proliferation characteristic of psoriasis [6,21,32,34].

The inclusion of psychological and relaxation methods in the care of patients with psoriasis shows significant benefits in both psychological and clinical areas [29].Relaxation techniques such as progressive muscle training, breathing exercises, and meditation lead to a reduction in muscle tension and stress levels, which are considered to be one of the key factors exacerbating the symptoms of the disease [31].Patients who use such interventions report improved sleep quality, reduced feelings of helplessness, and greater consistency in following therapeutic recommendations [9].

At the same time, psychological interventions based on cognitive behavioral therapy (CBT) aim to modify maladaptive cognitive patterns, improve the sense of control over the disease, and develop constructive coping strategies [13,26,27,30]. Studies indicate that this approach results in a reduction in depressive and anxiety symptoms and an improvement in quality of life. Importantly, some analyses also reported a beneficial

effect on the severity of skin changes, which was associated with a reduction in hypothalamic-pituitary-adrenal axis reactivity [10,28,29].

Programs integrating various forms of support, including elements of relaxation, mindfulness, and psychoeducation, have proven particularly promising. This approach promotes greater acceptance of one's appearance, improves self-esteem, and reduces avoidance behaviors, including withdrawal from social activities resulting from feelings of stigmatization [11,19].

In summary, relaxation and psychological interventions:

1. Reduce stress and tension,
2. Improve mood, self-esteem, and sleep quality,
3. Reduce avoidance behaviors and feelings of stigmatization,
4. Can support dermatological treatment and, in some cases, lead to objective improvement in skin condition.

From a practical point of view, the role of a dermatologist is not limited to pharmacological treatment-they should also consider referring patients to a psychologist in cases of severe emotional difficulties. In everyday practice, it is also possible to conduct brief psychoeducation in the office, including information about the impact of stress on the course of psoriasis and available methods of reducing it. Interdisciplinary cooperation between dermatologists, psychologists, and psychiatrists is crucial, as it allows for a comprehensive approach to the problem in accordance with the biopsychosocial model.

Despite consistent research results, certain limitations should be noted. Most studies involved small groups of patients, and the observation period was relatively short. In addition, the interventions used varied in terms of duration, intensity, and tools used, making it difficult to compare their effectiveness.

Strengths and weaknesses of the research

The strengths of the literature lie in the variety of research approaches-the literature includes observational, prospective, and randomized clinical trials, providing a relatively broad picture of the impact of stress and psychological interventions on psoriasis [8,11,12, 13,17,19]. The combination of clinical and psychological methods is also an important argument-some studies use both dermatological indicators (PASI, BSA) and psychological tools (HAD, DLQI, Skindex-29), which allows for a comprehensive assessment of the impact of interventions [8,9,11]. Another advantage is innovative interventions-research on mindfulness, biofeedback, and online CBT shows new possibilities for supportive treatment, which increases the practical clinical value and applicability of the results [15,16,17].

The weaknesses of the studies include small sample sizes—most studies included a small number of patients (often <100), which limits the strength of the conclusions and the generalizability of the results [13,15,17,19]. Short follow-up time—interventions were usually evaluated over a period of several weeks or months, which does not allow for a clear assessment of long-term effectiveness [17]. Another drawback is the heterogeneity of methods—differences in intervention types, duration, assessment tools, and patient selection criteria make it difficult to compare results between studies [19]. Lack of protocol standardization—for example, CBT and mindfulness programs varied significantly in structure and duration, which affects the difficulty of replication and comparison. The placebo effect and patient expectations are also possible-in psychological studies, it is difficult to completely rule out the influence of patient involvement, therapeutic relationship, and motivation on the results obtained [9].

Conclusions

The available data clearly indicate that psychological stress plays a key role in initiating and exacerbating the symptoms of psoriasis, affecting not only its clinical course but also the quality of life of patients [22,23, 24]. The inclusion of psychological and relaxation interventions, such as cognitive behavioral therapy (CBT), mindfulness-based stress reduction (MBSR) programs, or biofeedback-can be an important complement to dermatological treatment, reducing symptoms of anxiety and depression, improving mental well-being, and, in some studies, also reducing the severity of skin lesions [14,15,25].

Despite consistent results, it is important to highlight the significant limitations of previous studies, such as small sample sizes, heterogeneity of methods, and short follow-up periods, which make it difficult to draw far-reaching conclusions and assess the long-term effectiveness of interventions. Therefore, further well-designed randomized clinical trials (RCTs) with larger sample sizes and longer follow-up periods are needed to assess the durability of effects and identify objective indicators of treatment efficacy.

From a clinical perspective, integrating psychological components into traditional dermatological treatment-in line with the biopsychosocial model-appears to be a key direction in improving the quality of patient care. Furthermore, modern forms of digital support (e.g., e-CBT, mindfulness-based mobile applications, or telemedicine platforms) offer the possibility of increasing the availability of psychological therapies, especially in populations with limited access to specialists.

New directions and recommendations

1. Standardization of psychological interventions- there is a need to standardize CBT, MBSR, and biofeedback protocols, which will allow for comparability of results and the development of clinical guidelines.
2. Multicenter and long-term RCT studies- arger trials and longer follow-up will enable the assessment of the durability of effects and better identification of patient groups that benefit most.
3. Biomarkers of efficacy- future studies should include immunological parameters (e.g., TNF-α, IL-17, IL-23) and neurobiological indicators (e.g., activity of the prefrontal cortex, limbic system) as potential objective markers of treatment effects.
4. Integration with clinical practice- psychological interventions should be incorporated into standard treatment regimens, alongside pharmacotherapy and phototherapy.
5. New technologies and e-therapies- the development of e-CBT, online mindfulness interventions, and digital biofeedback may increase the scalability and accessibility of support.
6. Personalization of therapy- future approaches should take into account the patient's psychological profile and preferences, which will allow for better tailoring of the intervention and increase its effectiveness.

The integration of psychology and dermatology, supported by biomarkers and new technologies, is the most promising direction for the development of care for patients with psoriasis.

Disclosures

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