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Association of Psychic Stress with Clinical Severity and Symptoms of Psoriatic Patients

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The association of stress with psoriatic skin and joint symptoms was studied in 38 patients with psoriasis by dividing the patients into low-stress and high-stress groups based on their answers to four questionnaires (General health questionnaire, Somatization questionnaire, Depression questionnaire, and Life change questionnaire), measuring minor psychiatric disorder, psychosomatic reactivity, depression and life changes, respectively.

Compared to the low-stress group ($n=21$), the patients in the high-stress group ($n=17$) had more severe skin and joint symptoms and a higher score, which in established psoriatic General severity score that was calculated by judging Psoriasis Area and Severity Index, activity of psoriasis and the presence of joint symptoms. All the four questionnaires showed higher morbidity frequency and higher score points. Actively spreading psoriasis was significantly associated with stressful life events for men but not for women. However, in the low-stress group, men had experienced significantly fewer stressful events than women. Psoriasis Area and Severity Index showed strong correlation with the Somatization score, but no differences between men and women. The General severity score correlated with the Somatization score, and the higher the General severity score (score ≥ 6) the higher were all the four questionnaire scores. Also, patients having joint symptoms had higher scores in all of the four psychic questionnaires than patients without joint symptoms. By the chi-test, female patients with joint symptoms showed a significant correlation with the high General health questionnaire. The presence of joint symptoms showed a tendency for correlation in women with high depression level and in men with high somatization level.

This study suggests that psychic stress is associated with exacerbation of psoriasis, and more attention to mental well-being should be paid at least in the case of those psoriatic patients seeking actively for medical care. ***Key words: psoriasis; questionnaires; somatization; depression; life changes.***

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Stress, distress and a variety of psychiatric conditions are known to be triggering factors for several diseases. Stress modulates the physiological homeostasis in a complicated mechanism, involving alterations in the endocrine, immune and central nervous systems. Stressful conditions are known to suppress immunological responses (1–4).

The etiology of psoriasis is unknown, and several different factors can induce the exacerbation of skin lesions. Stress, such as marital and financial problems, anxiety or depression, has been shown to worsen the disease in 32 % up to 88 % of psoriatic patients (5–8). Polenghi et al. (9) described a high index of anxiety, poor tolerance of frustration, no open expression of aggressiveness and fragility of Id in their 100-patient group. Also, psoriatic patients tended to have behavior patterns that indicate irritability, resentment and guilt (9). During standardized stressor exposure, psoriatic patients have been shown to perceive certain challenging situations as more stressful, and their biochemical reactions differ from those of controls (10). Farber et al. (5) pointed to the symmetrical distribution of psoriatic lesions together with stress as a triggering factor of psoriasis, suggesting that a neurogenic agent such as substance P, released from dermal nerve endings, may be the link between the central nervous system and the development of psoriatic lesions.

The purpose of this study was to find out if the clinical manifestation of the disease has any relationship to the severity of psychic stress in patients with psoriasis. For this, the patients were clinically examined and interviewed for their stress condition.

MATERIAL AND METHODS

Patients

The study comprised 38 patients with psoriasis vulgaris (24 males and 14 females, age 23–69 years). The patients were examined in the Kuopio University Hospital (24 patients) and in the North Carelia Central Hospital (14 patients). The patients were taken into this study without any prior selection criteria from consecutive incoming patients (16 patients) who were willing to participate in the study or from voluntary patients (22 patients) recruited through local Psoriasis Patients' Associations during October 1992-April 1993. Only patients with no systemic or effective local treatments (e.g. PUVA or UVB) were accepted. The protocol of this study was approved by the Ethics Committee of the Kuopio University Hospital.

The dermatological status of the patients was assessed by two dermatologists, and the joint symptoms were recorded. Psoriasis Area and Severity Index (PASI) was assessed for each body part of all patients for total PASI calculation. Points for erythema, infiltration and desquamation ranged from 1 to 4, and the involved area from 1 to 6. Thus, theoretically PASI ranges from 0 to 72.

Psoriasis General Severity (GS) score was established by judging PASI score, activity of the psoriasis at the study, and the presence of joint symptoms. PASI less than 5 was scored as score 1, PASI ≥ 5 and <10 as score 2, PASI ≥ 10 and <20 as score 3, and PASI ≥ 20 as score 4. Joint symptoms and active phase of the disease, both graded with yes or no answers, were scored to 2 or 0, respectively. Thus, the total GS-score ranges from 1 to 8.

Stress level evaluated by the dermatologist was scored by using the Global Assessment Scale (GAS), which is based on an evaluation of psychiatric symptoms, the quantity and quality of human contacts and the degree of general life control (range 0–99, with lower scores indicating poorer psychological coping) (11). The dermatological stress evaluation was assessed as 5 scores. In score 1 (corresponding GAS-score 81–99) signs or symptoms of anxiety or stress were not

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detectable or were very mild. In score 2 (GAS-score 61–80) mild symptoms occurred or slight difficulties were present in social life during less than 2 weeks. Score 3 (GAS-score 51–60) had moderate level symptoms like temporary anxiety, difficulties in concentration capacity or difficulties in social life. Score 4 (GAS-score 41–50) included strong symptoms like suicide thoughts, continuous anxiety, obsessive-compulsive functions or severe disturbance in social life or work. In score 5 (GAS-score ≤ 40) the patients had severe symptoms like delusional or wandering thoughts or inadequate behavior or severe communication problems in social life or work. Score 1 is considered as no stress; scores 2–5 include variable stress level.

The psychological classification of the patients by questionnaires was assessed by a psychiatrist.

The subjects' mental well-being was evaluated by means of four self-rating scales, validated in earlier studies. Psychiatric morbidity and the amount of stress the patients had experienced before the exacerbation of psoriasis were recorded. The patient was classified into the low-stress group if only one of the four different questionnaires turned positive, whereas at least two positive tests were needed for placing the patient in the high-stress group.

(1) Minor psychiatric disorder. The probability of a minor psychiatric disorder (or amount of psychological distress) was assessed by means of the 12-item version of the General Health Questionnaire (GHQ) (12–14). Items cover anxiety, depression, self-esteem and day-to-day difficulties and are scored from 0 to 12, with higher scores indicating greater psychological distress. The GHQ-12 score could be dichotomized, and thus a score of 0–2 points indicated a normal level of mental well-being, whereas a score of 3–12 points indicated a minor psychiatric disorder (15).

(2) Psychosomatic reactivity. This was assessed by a Psychosomatic score subjectively by means of the 13-item symptom list compiled by Derogatis et al. (16). The questionnaire has previously been used in Finland in the extensive Mini-Finland health study (17). Responses were scored on a scale from 0 to 52, with higher scores indicating a stronger tendency toward psychosomatic symptoms. Those with scores of over 15 were considered to have a clinically important tendency toward psychosomatic reactivity (17).

(3) Depression. Depression score was measured separately using the 13-item version of Beck's inventory for measuring depression (18). Responses were scored on a scale from 0 to 39, with higher scores indicating greater depression. In accordance with the literature (19, 20), a score of 5 points was established as a cut-off point for assessing depression. Those with scores of 4 and less were to be treated as not depressed.

(4) Life changes. A life change questionnaire (33 questions) was used to identify the life changes that had occurred within 3 months before clinical examination and which might have a bearing on the patients' mental health. The inquiry was based on the method developed by Holmes & Rahe (21). The life change was scored high if the patient had experienced at least one life change that he or she considered moderate or severe for his or her mental well-being.

Statistical analysis

The results were analyzed by using the non-parametric Mann–Whitney U-test. Group analysis was performed by using the chi-square statistical test.

RESULTS

The PASI score for all the patients in this study was 6.81 ± 4.17 (mean $\pm$ S.D., $n=38$), for men 8.13 ± 4.55 (range 2.4–20.5, $n=24$) and for women 4.54 ± 2.00 (range 1.6–9.0, $n=14$), the difference being statistically significant ($p=0.0089$). There was no correlation in the age of the patients with psoriasis activity, with the presence of joint symptoms or with PASI score (data not shown). General Severity scores, being 4.08 ± 1.91 ($n=24$) for men and 3.29 ± 1.94 ($n=14$) for women, did not differ statistically ($p=0.232$).

The classification of the psoriatic subjects into two stress groups was based on the four questionnaires measuring different psychological aspects. PASI scores were 8.14 ± 4.93 ($n=17$) and 5.73 ± 3.16 ($n=21$) for high- and low-stress groups, respectively, and they did not differ statistically ($p=0.091$).

Of the psoriatic patients entering this study, 42% had a high GHQ score, 37% had depression according to Beck's Depression score, 45% had a high Psychosomatic score, and 66 % had experienced stressful life events during the last 3 months.

Table I shows the results of the comparison of PASI scores in psoriatic patients grouped by means of the four stress-measuring questionnaires. High Psychosomatic score

Table I. *Comparison of PASI scores with grouping of patients by stress-measuring questionnaires*

GHQ = General Health Questionnaire (high: $\geq$ score 3), PsySom = Psychosomatic symptoms (high: $\geq$ score 16), Depr = Depression (high: $\geq$ score 5), Life Event score (high: $\geq$ score 1). Statistics by Mann–Whitney U-test, statistically significant results marked with *. Values as mean $\pm$ S.D.

Patient group	PASI score (all)	PASI score (men)	PASI score (women)	Mann–Whitney U-test (men-women difference)
GHQ score high	7.87 ± 5.01	8.35 ± 5.48 ($n=13$)	5.77 ± 0.32 ($n=3$)	$p=0.95$
GHQ score low	6.04 ± 3.34	7.87 ± 3.39 ($n=11$)	4.21 ± 2.15 ($n=11$)	$p=0.01$*
	$p=0.24$	$p=0.66$	$p=0.39$	
PsySom score high	8.60 ± 5.23	9.71 ± 5.47 ($n=13$)	5.00 ± 1.91 ($n=4$)	$p=0.17$
PsySom score low	5.36 ± 2.31	6.27 ± 2.18 ($n=11$)	4.36 ± 2.11 ($n=10$)	$p=0.04$*
	$p=0.04$*	$p=0.16$	$p=0.70$	
Depression score high	8.27 ± 5.24	9.13 ± 5.63 ($n=11$)	5.13 ± 1.03 ($n=3$)	$p=0.26$
Depression score low	5.96 ± 3.22	7.29 ± 3.40 ($n=13$)	4.38 ± 2.20 ($n=11$)	$p=0.02$*
	$p=0.48$	$p=0.48$	$p=0.45$	
Life Event score high	6.93 ± 4.59	8.71 ± 5.26 ($n=14$)	4.67 ± 2.10 ($n=11$)	$p=0.04$*
Life Event score low	6.58 ± 3.37	7.33 ± 3.42 ($n=10$)	4.07 ± 1.85 ($n=3$)	$p=0.15$
	$p=0.90$	$p=0.66$	$p=0.79$	

($p=0.044$) correlated statistically significantly with the PASI score, and a trend for correlation between high and low Psychosomatic score ($p=0.164$) in male patients. A statistically significant difference was found in the PASI score between males and females in the low GHQ score ($p=0.0078$), low Psychosomatic score ($p=0.041$) and low Depression score ($p=0.024$), but not in the high-score groups. Similar difference not being significant was observed also with the low Life event score ($p=0.151$), but a significant difference with the high Life event score ($p=0.037$) between men and women. Higher GS scores (6 or more) correlated positively with all of the four stress-measuring questionnaire scores (data not shown).

Table II shows the results of grouping the psoriatic patients by the stress-measuring questionnaires with respect to clinical symptoms. Activity of psoriasis tended to correlate with the Psychosomatic score ($p=0.087$) and with the high Depression score ($p=0.126$). The activity of psoriasis correlated significantly with the high Life event score ($p=0.029$). The presence of joint symptoms, however, did not significantly correlate with stress or its measuring parameters (Table II), although some correlation tendency was seen between joint symptoms and higher Psychosomatic score points (Table III). Group analysis by the chi-test (Table III) revealed a positive significant correlation with women's GHQ score ($p=0.024$) and an almost significant correlation with men's Psychosomatic score ($p=0.093$) and women's Depression score ($p=0.078$).

Psychic stress evaluation by the dermatologist correlated well with the GHQ score ($p=0.028$) and rather well with the Depression score ($p=0.067$). The GS score (estimated on clinical basis of psoriasis, e.g. on PASI, on active phase of the disease and on the presence of joint symptoms) correlated well ($p=0.024$) with the Psychosomatic score (Table II).

If the cut-off limit for depression were set at ≥ 10 (moderate or severe depression, i.e. instead of ≥ 5 used in this study), then the number of depression-positive patients would decrease from 14 to 6. Thus, the activity of psoriasis vs. depression would become statistically significant ($p=0.016$).

Table IV shows results where the groups with active psoriasis

Table II. *Clinical symptoms of psoriatic patients grouped by means of stress-measuring questionnaires*

GHQ = General Health Questionnaire (High: $\geq$ score 3), PsySom = Psychosomatic symptoms (High: $\geq$ score 16), Depr = Depression (High: $\geq$ score 5). Life Events (High: ≥ 1 stressfully experienced events). Stress level score by dermatologist, see Methods. Statistics by Mann–Whitney U-test, or chi-square test for group analysis, statistically significant results marked with *. Values as mean $\pm$ S.D.

Patient group	Active psoriasis ($n=21$)	Joint symptoms ($n=17$)	Stress level score by dermatologist	General Severity score
High GHQ score ($n=16$)	10/16	8/16	2.00 ± 0.82	4.25 ± 1.99
Low GHQ score ($n=22$)	11/22	9/22	1.41 ± 0.59	3.45 ± 1.87
p-value	$p=0.44$	$p=0.58$	$p=0.03$*	$p=0.21$
High PsySom score($n=17$)	12/17	10/17	1.88 ± 0.86	4.65 ± 1.97
Low PsySom score ($n=21$)	9/21	7/21	1.48 ± 0.60	3.09 ± 1.64
p-value	$p=0.09$	$p=0.12$	$p=0.16$	$p=0.02$*
High Depression score ($n=14$)	10/14	6/14	2.00 ± 0.88	4.36 ± 2.10
Low Depression score ($n=24$)	11/24	11/24	1.46 ± 0.59	3.46 ± 1.79
p-value	$p=0.13$	$p=0.86$	$p=0.07$	$p=0.18$
High Life Events score ($n=25$)	17/25	10/25	1.72 ± 0.79	4.00 ± 2.14
Low Life Events score ($n=13$)	4/13	7/13	1.54 ± 0.66	3.38 ± 1.45
p-value	$p=0.03$*	$p=0.42$	$p=0.57$	$p=0.38$

Table III. *Comparison of joint symptoms with PASI score and stress-measuring questionnaire scores*

GHQ = General Health Questionnaire score, PsySom = Psychosomatic symptom score, Depr = Depression score. Statistics by chi-test or Mann–Whitney U-test for PASI score, statistically significant results marked with *. Values as mean $\pm$ S.D.

Patient group	PASI score	GHQ score	PsySom score	Depr score	Life Event score
Joint symptom positive ($n=17$)	7.65 ± 4.20	3.82 ± 3.88	17.5 ± 10.2	4.59 ± 4.39	1.47 ± 1.63
Joint symptom negative ($n=21$)	6.13 ± 4.11	3.10 ± 3.36	10.4 ± 8.9	3.71 ± 3.59	1.67 ± 1.77
p-values all	$p=0.19$	$p=0.58$	$p=0.12$	$p=0.86$	$p=0.42$
p-values women	$p=0.37$	$p=0.02$*	$p=0.73$	$p=0.08$	$p=0.35$
p-values men	$p=0.25$	$p=0.43$	$p=0.09$	$p=0.36$	$p=0.73$

Table IV. *Comparison of psoriasis activity with stress-measuring questionnaire scores and sex*

GHQ = General Health Questionnaire score, PsySom = Psychosomatic symptom score, Depr = Depression score. Statistics by chi square-test or by Mann–Whitney test for age, statistically significant results marked with *. Values as mean ± S.D.

Patient group	Age (years)	GHQ score	PsySom score	Depr score	Life Events	GHQ (men)	GHQ (women)	PsySom (men)	PsySom (women)	Depr (men)	Depr (women)	Life Events (men)	Life Events (women)
Active psoriasis ($n=21$, Men 14, Women 7)	43.0 ±10.8	4.14 ±4.27	15.7 ±11.4	5.33 ±4.60	2.19 ±1.75	4.64 ±4.27	3.14 ±4.41	15.4 ±11.1	16.3 ±13.1	5.79 ±3.94	4.43 ±5.94	2.14 ±1.79	2.29 ±1.80
Stable psoriasis ($n=17$, Men 10, Women 7)	49.9 ±11.9	2.53 ±2.27	10.9 ±7.4	2.59 ±2.24	0.82 ±1.29	2.90 ±2.51	2.00 ±1.91	12.9 ±8.1	8.1 ±5.9	2.70 ±2.31	2.43 ±2.30	0.30 ±0.48	1.57 ±1.72
chi-test p-value	0.13	0.44	0.09	0.02*	0.03*	0.73	0.52	0.24	0.24	0.06	0.13	0.02*	0.52

and stabile phase psoriasis were compared. The differences showed a positive trend for correlation ($p=0.087$) with Psychosomatic score and clearly significant correlation with Depression score ($p=0.016$) and with the number of stressful life experience events ($p=0.029$). Life event scores were significantly positively different with male psoriatic patients, but not with female patients, whereas depression scores were similarly different although statistically slightly beyond significance. Unexpectedly, the number of life events in stabile psoriasis group was lower in men than in women.

DISCUSSION

Psoriasis is primarily thought to be a disease of the skin, but several triggering factors are known to be involved in the development of psoriatic lesions. Psychic stress has been reported in several studies as one potent etiological factor for inducing or exacerbating psoriasis (5–10), which is in accordance with the results of this study. The high-stress patients tended to have the most active flare of skin lesions as well as their joint symptoms. The mechanism involved in stress-mediated psoriatic lesions is unknown. Several possibilities have been suggested: metabolic and endocrine alterations, e.g. increased urinary adrenaline but decreased plasma cortisol levels (10), stress-induced changes in the immune system, such as immunosuppression (1–4, 22), and neurogenic inflammation employing cutaneous sensory nerves and mast cells but also other cells of the immune system (5, 23–25). Since the elements for neurogenic inflammation exist in the psoriatic lesion (23–26), and the possibility of stress-induced exacerbation of psoriasis has not been much investigated, we conducted this study as a continuation of our recent pilot study in this field (27).

In general, the majority of psoriatic patients do not visit the dermatology clinic regularly. The patients chosen in this study were selected randomly from the patient flow at the Department of Dermatology and the patients were asked to answer the questionnaires. However, a selection factor could exist regarding the representativity of the psoriatic patient group, since they had been active in seeking for medical care to control their disease. Some of these patients might have had problems in coping with their life, but on the other hand, we could also have missed some patients seeking for help from mental or other health care services. Nevertheless, these results are considered to be representative at least for those patients seeking actively for medical care of their psoriasis.

The presence of severe psychic stress in our psoriatic material is considerable (42%), paralleling previous studies (5, 9). Also, 37% of the patients had depression, being clearly more frequent than in the population in general. Sixty-six per cent of the psoriatic patients experienced stressful life events, which is in accordance with results published earlier, e.g. 67.6% (8), 80% (7) and 72% (28). The methods for high- and low-stress classification, based on various psychic symptoms and stressful life changes of the patients in this study, are generally accepted and used in clinical practice (12, 13, 16, 17, 21, 29). Both the external reality and the private world of experience were covered and assessed with the questionnaires, giving a comprehensive view of the factors known to be associated with psychic stress. However, the classification of patients into groups according to the severity of stress may involve problems, since individual patients can perceive similar stressful conditions

differently, and overlapping may exist in borderline cases. However, the high-stress group was remarkably homogeneous in respect to life changes together with the highest scores of either the GHQ or the psychosomatic reactivity (i.e. the SCL-90 -scale (16)) questionnaires.

This study shows that psychic stress is associated with the exacerbation of psoriasis, and more active attention to mental well-being should be paid at least in the case of psoriatic patients seeking actively for medical care.

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