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Research paper

# Depressiveness, measured with Beck Depression Inventory, in patients with psoriasis

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ABSTRACT

*Background:* The aim of this study was to identify demographic and clinical factors predisposing to depressiveness during the course of psoriasis.
*Method:* The study included 239 patients with psoriasis (15–76 years, 31.8% of women) and 123 healthy controls (17–74 years, 32.5% of women). Dependent variable in the analysis was Beck Depression Inventory (BDI) score. Explanatory variables included: age, sex, marital status, education, occupational activity, body mass index (BMI), systolic and diastolic blood pressure, history of smoking, average number of smoked cigarettes, skin lesions visible to others, comorbidities, including arterial hypertension and arthritis, number of previous hospitalizations and family history of psoriasis.
*Results:* Psoriatics showed higher BDI scores than the controls, and significantly more often presented with depressiveness. Depressiveness correlated with psoriasis, older age, female sex, lack of higher education, occupational inactivity, higher BMI, visible skin lesions, comorbidities, including arterial hypertension and arthritis, greater number of previous hospitalizations and lack of family history of psoriasis. Multivariate analysis showed than independent predictors of any grade depressiveness were psoriasis (OR=2.26, 95%CI: 1.11–4.60, p=0.024), older age (OR=1.03, 95%CI: 1.01–1.05, p=0.005) and female sex (OR=2.73, 95%CI: 1.45–5.12, p=0.002).
*Limitations:* Cross-sectional, non-prospective analysis. Selection bias.
*Conclusions:* Patients with psoriasis, irrespective of its severity and related complications, are at increased risk of depressiveness. The risk of secondary depressiveness is particularly high in psoriatic women and older persons (or individuals diagnosed with psoriasis at younger age). Individuals from this group should be monitored for potential depressive symptoms.

## 1. Introduction

Epidemiological data suggest that the incidence of psoriasis still increases (Parisi et al., 2013). Both the results of many studies and clinical observations imply that psoriasis, especially severe, is not an isolated condition but may co-exist with an array of other disease entities, most of all with the components of the so-called metabolic syndrome, but also with alcoholism, nicotinism and various mental disorders (Bohm et al., 2013; Golpour et al., 2012; Parisi et al., 2013; Strohal et al., 2014). Depressiveness is the most common comorbidity of psoriasis among the diseases from the latter group. According to various authors, depressiveness of varying severity may affect between ca. 10% and up to 80% of psoriatic patients, and its risk in this group is 1.5- to 2-fold higher than in psoriasis-free controls (Korman et al., 2016; Lakshmy et al., 2015).

Concomitant depressiveness exerts a detrimental effect on clinical outcome of psoriasis; interestingly, this relationship seems to be bidirectional: depressiveness is reflected by greater severity of psoriatic symptoms, and presence of skin lesions exacerbates the course of depressive disorder. Since depressiveness is widely known to interfere with medication adherence (Connor et al., 2015), and thus also with the treatment outcome, a kind of vicious circle develops (Fig. 1).

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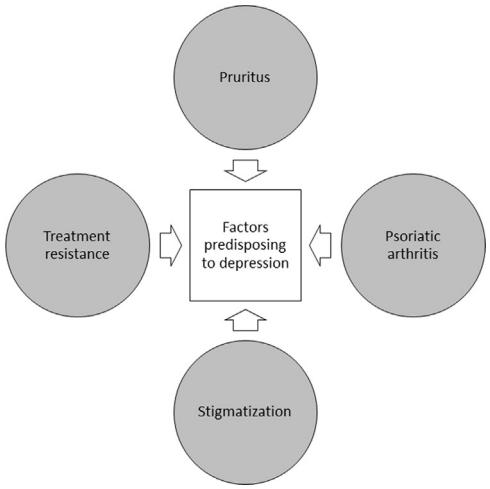


**Fig. 1.** Factors predisposing to depression during the course of psoriasis.

**Table 1**
Statistical characteristics of BDI scores, prevalence of depression and its severity among patients with psoriasis and controls.

| Parameter | Psoriasis (n=239) | Controls (n=123) | p-value |
|---|---|---|---|
| Overall BDI score, points | 11.00 (0.00–47.00) | 5.00 (0.00–37.00) | < 0.001 |
| Individual BDI items, points: | | | |
| • BDI-A | 0.00 (0.00–3.00) | 0.00 (0.00–2.00) | < 0.001 |
| • BDI-B | 1.00 (0.00–3.00) | 1.00 (0.00–3.00) | < 0.001 |
| • BDI-C | 0.00 (0.00–3.00) | 0.00 (0.00–3.00) | < 0.001 |
| • BDI-D | 0.00 (0.00–3.00) | 0.00 (0.00–3.00) | < 0.001 |
| • BDI-E | 0.00 (0.00–3.00) | 0.00 (0.00–2.00) | 0.001 |
| • BDI-F | 0.00 (0.00–3.00) | 0.00 (0.00–3.00) | < 0.001 |
| • BDI-G | 0.00 (0.00–3.00) | 0.00 (0.00–2.00) | < 0.001 |
| • BDI-H | 0.00 (0.00–3.00) | 0.00 (0.00–2.00) | < 0.001 |
| • BDI-I | 0.00 (0.00–3.00) | 0.00 (0.00–1.00) | < 0.001 |
| • BDI-J | 0.00 (0.00–3.00) | 0.00 (0.00–3.00) | < 0.001 |
| • BDI-K | 1.00 (0.00–3.00) | 0.00 (0.00–3.00) | 0.001 |
| • BDI-L | 0.00 (0.00–3.00) | 0.00 (0.00–3.00) | 0.001 |
| • BDI-M | 1.00 (0.00–3.00) | 0.00 (0.00–2.00) | 0.003 |
| • BDI-N | 0.00 (0.00–3.00) | 0.00 (0.00–2.00) | < 0.001 |
| • BDI-O | 0.00 (0.00–3.00) | 0.00 (0.00–3.00) | < 0.001 |
| • BDI-P | 1.00 (0.00–3.00) | 0.00 (0.00–3.00) | < 0.001 |
| • BDI-Q | 1.00 (0.00–3.00) | 0.00 (0.00–10.00) | < 0.001 |
| • BDI-R | 0.00 (0.00–3.00) | 0.00 (0.00–1.00) | < 0.001 |
| • BDI-S | 0.00 (0.00–3.00) | 0.00 (0.00–3.00) | < 0.001 |
| • BDI-T | 1.00 (0.00–3.00) | 0.00 (0.00–2.00) | < 0.001 |
| • BDI-U | 0.00 (0.00–3.00) | 0.00 (0.00–3.00) | 0.005 |
| Depression any grade, n (%) | 118 (49.6%) | 19 (15.7%) | < 0.001 |
| Depression severity, n (%): | | | |
| • Mild | 87 (36.3%) | 15 (12.4%) | 0.780 |
| • Moderate | 31 (13.0%) | 4 (3.3%) | |
| • Severe | 0 (0.0%) | 0 (0.0%) | |

Moreover, recent evidence suggests that occurrence of depression during the course of psoriasis is a significant risk factor for cardiovascular disorders, such as myocardial infarction, stroke and arrhythmia (Egeberg et al., 2016), and may result in suicidal attempts (Gupta and Guptat, 2001; Russo et al., 2004).

All the data mentioned above justify the identification of psoriatic patients predisposed to depressiveness and providing them with a complex care, including psychological support. Consequently, the aim of this study was to identify demographic and clinical factors predisposing to depressiveness during the course of psoriasis.

## 2. Methods

### 2.1. Participants

The study included 239 patients with psoriasis (median age 48 years, range 15–76 years), among them 76 (31.8%) women and 163 (68.2%) men, and 123 healthy controls (median age 42 years, range 17–74 years), among them 40 (32.5%) women and 83 (67.5%) men. Psoriatic patients were recruited at the Department of Dermatology, Venereology and Pediatric Dermatology, Medical University of Lublin (Poland) between 2014 and 2016. Median duration of psoriasis was 456.3 months (range 2.5–1642.5 months) and median PASI score equaled 22 (range 0–43.5). Control group was formed of volunteers treated due to other reasons, such as pigment nevi, mild acne, small filiform warts and fungal nail infections. Aside from providing written informed consent, the only inclusion criterion of the study was presence of active psoriasis. The exclusion criteria were: history of a recent myocardial disease, renal insufficiency, severe systemic diseases with fever, and mental disorders, past or present treatment with biologicals or immunosuppressive agents. Furthermore, neither psoriatics nor the controls received any medications that might interfere with their depressiveness levels.

### 2.2. Ethics

The protocol of the study was approved by the Local Bioethics Committee at the Medical University of Lublin (decision no. KE-0254/283/2014 of 30 October 2014) and written informed consent was sought from all the study subjects.

### 2.3. Analyzed variables

During routine control visit in the clinic, each participant was asked to complete Beck Depression Inventory (BDI). This instrument includes 21 items, each scored on a 4-point scale, from 0 to 3. Final score, ranging between 0 and 63 points, reflects presence of depressiveness and severity thereof. The result is interpreted as the lack of depression (0–11 points), mild depression (12–26 points), moderate depression (27–49 points) or severe depression (50–63 points). Examination with BDI may refer to any period in the past, for example to the last month preceding control visit, as it was the case in our patients. The instrument showed very good internal consistency rate, as demonstrated by Cronbach's alpha equal to 0.91.

The list of analyzed explanatory variables included: age, sex, marital status, education, occupational activity, body mass index (BMI), systolic and diastolic blood pressure (SBP and DBP), history of smoking, average number of smoked cigarettes, presence of skin lesions visible to others, comorbidities, including arterial hypertension and arthritis, number of previous hospitalizations and family history of psoriasis.

### 2.4. Statistical analysis

Normal distribution of continuous variables was verified with Shapiro-Wilk test. Statistical characteristics of continuous variables were presented as medians and ranges, and statistical characteristics of discrete variables as numbers and percentages. Intergroup comparisons of continuous variables were based on Mann-Whitney *U*-test and Kruskal-Wallis test, and intergroup comparisons of discrete variable distributions on Pearson's chi-square test and Fisher's exact test. Power and direction of relationships between pairs of variables were assessed based on Spearman rank correlation coefficients (R). Power and direction of associations between the presence of depression of any grade, demographic and clinical variables were assessed using univariate and multivariate logistic regression models. Odds ratios (ORs) for co-existence of depression with explanatory variables were calcu-