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HIGH PREVALENCE OF METABOLIC DISORDERS IN PSORIASIS PATIENTS

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Abstract

Recent studies have shown that psoriasis is a systemic disorder associated with an increased prevalence of metabolic anomalies. This study compares the prevalence of obesity and metabolic disorders in psoriasis patients and the general population. 302 patients and 621 controls were included in a retrospective case control study. We compared the proportion of obesity, diabetes, and dyslipidemia between case and control groups. Psoriasis patients had higher odds of diabetes (OR 1.97; 95% CI, 1.36-2.86), dyslipidemia (OR 1.76; 95% CI, 1.31-2.37), and obesity (OR 2.84; 95% CI 1.87-4.31) compared with controls. The risk of dyslipidemia and obesity correlated with disease severity. The long term management of psoriasis patients should address not only the cutaneous and joint manifestations, but also the prevention and correction of eventual associated metabolic disorders.

key words: *Psoriasis; obesity; diabetes; dyslipidemia; systemic inflammation*

Introduction

Psoriasis is a frequent chronic and recurrent inflammatory disease affecting 2–3% of the Caucasian population [1]. Although extremely bothersome and stigmatizing, it was long considered a benign disease with no influence on the vital prognosis, its main extracutaneous manifestation being psoriatic arthritis, present in 5% -20% [2] of patients. It was only recently that its systemic nature was highlighted by a series of studies that identified an increased cardiovascular risk profile [3-6] and a higher cardiovascular mortality rate in psoriasis patients compared with the general population [3]. These can at least partially be explained by a higher prevalence of traditional cardiovascular risk factors in psoriasis patients [5,7,8]. Among these, obesity and diabetes were shown to be more prevalent in patients with psoriasis and correlated with the disease severity [8]. Moreover, a significantly deteriorated lipid profile was demonstrated in psoriasis patients compared with healthy controls [9,10], contributing to psoriasis associated morbidity

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and mortality. Recent evidence suggests a complex bidirectional relationship between psoriasis and these disorders, but the exact mechanisms underlying these associations are yet unclear.

Aim

The aim of the current study was to determine the prevalence of obesity, diabetes, and dyslipidemia among patients with mild and severe psoriasis versus controls and to discuss the association between these disorders and psoriasis.

Materials and methods

Study groups and data source

We conducted a retrospective case control study using the medical records of the patients who presented to the Dermatology Department of Elias Emergency University Hospital, Bucharest during the period January 2006 - December 2010. Both inpatient and outpatient records were taken into account. We included 302 patients diagnosed with psoriasis who were 18 years or older at presentation. Patients were classified as having mild psoriasis if they only needed topical treatment to control their condition and as having severe psoriasis if systemic treatment was ever neccessary for this dermatosis.

The control group was constituted of patients older than 18 years who presented to our clinic during the mentioned time period for diseases other than psoriasis, who did not suffer from any chronic inflammatory disease. Two controls were randomly chosen for each psoriasis patient and they were matched by age and sex.

Measurement of covariates

The following variables were assessed: sex, age at presentation, body mass index (calculated at presentation as the weight (kg)/height^2 (m); obesity was defined as BMI > 30 kg/m^2), the presence or absence of arterial hypertension (antihypertensive medication or systolic blood pressure >140 mmHg and/or diastolic blood pressure >90 mmHg), fasting hypertriglyceridemia (>150 mg/dl), fasting hypercholesterolemia (>200 mg/dl), impaired glucose tolerance (fasting glucose level 100 – 125 mg/dl), and diabetes (fasting glucose level ≥ 126 mg/dl).

Statistical analyses

Continuous data were expressed as the mean ± SD and categorical variables were expressed as percentages. We used Student's t test to analyze continuous variables and Fisher exact test for categorical parameters. The rates of metabolic disorders in the mild and severe psoriasis groups were compared with their rates in the control population and adjusted for age. The results were expressed as odds ratios (ORs). For all odds ratios, we calculated 95% confidence intervals (CIs). Multivariate logistic regression analyses were used to measure the association between psoriasis and different disorders.

All statistical analysis was performed using SPSS V17, STATA V10. Two-sided *P* values less than 0.05 were considered statistically significant.

Resuts

The study included 302 patients with psoriasis and 621 controls. Patients with psoriasis were older than matched control patients, the mean age of our patients being 50 ± 16 and that of controls 45 ± 18. The sex ratio (F/M) was 1 in the psoriasis group and 1.7 in the control group. However, the distribution of these variables was similar between patients with psoriasis and controls.

The demographic characteristics of the study groups are presented in Table 1.

Table 1. Baseline Characteristics of Study Groups

Parameter	Psoriasis Patients (n =302)	Severe Psoriasis Patients (n=121)	Mild Psoriasis Patients (n=121)	Controls (n=621)
Age, years (mean ± SD)	50 ± 16	52 ± 13	50 ± 18	45 ± 18
Female sex (%)	50.3	44.6	54.2	63.2
Duration of psoriasis, years (mean ± SD)	8 ± 9	13 ± 12	5 ± 7	
Methotrexate (%)		86		
Psoralen plus ultraviolet A (%)		61.2		
Retinoids (%)		24.8		
Biologic therapies (%)		20.9		
Ever smoked (%)	43.4	57.4	32.8	26.5
Diabetes (%)	20.9	29	18.8	11.8
Body mass index > 30 kg/m^2 (%)	31	39.1	24.8	13.6
Hyperlipidemia (%)	63.2	71.9	57.5	50.2

40% (121) of our psoriasis patients were classified as having severe psoriasis and 60% as having mild psoriasis. The majority of patients with severe psoriasis received methotrexate (86%), followed by photochemotherapy (61.2%), retinoids (24.8%) and biologic therapy (20.9%).

Psoriasis patients were more likely to be obese than controls. Respective prevalence rates of obesity in patients with severe, mild psoriasis and in controls were 39.1%, 24.8%, and 13.6%. The odds ratio for obesity in psoriasis patients compared with controls was 2.84; 95% CI, 1.87-4.31, $p<0.05$. Obesity was significantly more prevalent in those with severe psoriasis than in the ones with mild psoriasis (OR 1.95; 95% CI, 1.08-3.51, p=0.036).

The prevalence rate of diabetes was significantly higher in patients with severe psoriasis (29%) compared with mild psoriasis patients (18.8%) and controls (11.8%). Patients with both mild and severe psoriasis had higher age-adjusted odds of diabetes than controls (OR 1.73; 95% CI, 1.11-2.71, p=0.018 and OR 2.36; 95% CI, 1.45-3.83, p=0.01 respectively). The excess prevalence of diabetes remained substantial in patients with psoriasis after adjustment for obesity and smoking status, suggesting that it is independently associated with psoriasis.

Dyslipidemia was also more prevalent in severe psoriasis patients (71.9%) compared with mild psoriasis patients (57.5%) and controls (50.2%). In our study, patients with psoriasis had higher age-adjusted odds of dyslipidemia (OR 1.76; 95% CI, 1.31-2.37, p=0.0001) compared with controls. Moreover, the risk of dyslipidemia correlated with disease severity, being higher in the severe psoriasis group compared with the mild psoriasis group (OR 1.89; 95% CI, 1.15-3.10, p=0.011). Similar results were obtained after exclusion of patients that received therapies associated with dyslipidemia, namely oral retinoids.

The proportions of metabolic disorders in patients with psoriasis and the control group are presented in Table 2.

Table 2. Prevalence odds ratios of individual cardiovascular risk factors.

Variable	Psoriasis Patients vs Controls (95% CI)	Severe Psoriasis Patients vs Controls (95% CI)	Mild Psoriasis Patients vs Controls (95% CI)	Severe vs Mild Psoriasis Patients (95% CI)
Diabetes	1.97(1.36-2.86)	2.36(1.45-3.83)	1.73(1.11-2.71)	1.36(0.77-2.38) NS
Dyslipidemia	1.70(1.27–2.28)	2.53(1.65-3.88)	1.33(0.95-1.86)	1.89(1.15-3.10)
Obesity	2.84(1.87-4.31)	4.07(2.47-6.71)	2.09(1.27-3.42)	1.95(1.08-3.51)

CI, confidence interval; NS, not statistically significant

Table 3 shows the laboratory characteristics of our study groups.

Table 3. Laboratory Characteristics of Study Groups.

Variable	Severe Psoriasis Patients	Mild Psoriasis Patients	Controls
Glycemia mg/dl	98.38 ± 28.15	95.75 ± 29.76	89.56 ± 25.83
Total cholesterol mg/dl	222.18 ± 51.75	206.61 ± 43.27	201.30 ± 58.48
Triglycerides mg/dl	153.64 ± 95.13	125.67 ± 60.62	115.14 ± 68.05

Discussions

Obesity, diabetes, and dyslipidemia were all associated with both mild and severe psoriasis in our study. This is consistent with previous epidemiological investigations that demonstrated a higher prevalence of these disorders among psoriasis patients compared with the general population [5,7-14].

Recent studies have shown that psoriasis patients are more likely to be obese than the general population and that obese psoriasis patients generally have a more severe form of disease [15]. Our results confirm these findings, obesity being more prevalent in the severe psoriasis group compared with the mild psoriasis group and with controls. The relation between psoriasis and obesity is probably bidirectional. Psoriasis alters the patient's physical, mental and social well-being, increasing the chances of overfeeding, smoking, increased alcohol consumption, and sedentary life style [16-18]. On the other hand, overweight often precedes psoriasis onset and seems to increase the risk of psoriasis in a dose-dependent manner [19]. This may be explained by the fact that human adipose tissue is an active endocrine organ that produces a series of bioactive proteins, among which are adipokines (adiponectin, leptin), proinflammatory cytokines [tumor necrosis factor (TNF)- α , interleukin (IL)-6) and chemokines (IL-8, chemoattractant protein (MCP)-1) [20,21,22]. Obesity is associated with a chronic low grade systemic inflammation due to the increased production of proinflammatory cytokines [23] and decreased production of anti-inflammatory adipokines in the adipose tissue [24,25] that favors the appearance of psoriasis in genetically predisposed individuals and influences its severity [23]. These changes are reversible with weight loss [26], which leads to significant clinical improvement and even complete remission of psoriasis lesions [27,28]. Another link between obesity and psoriasis onset or exacerbation is the psychological burden of obese individuals and the increased prevalence of depression among them, a well documented trigger of psoriasis lesions.

We also observed a significant association between psoriasis and diabetes. Our study advances previous findings from cross-sectional studies that identified an elevated risk of diabetes among psoriasis patients [7,11,12]. Potential explanations for this association include the higher prevalence of well known risk factors for the development of diabetes, such as obesity and smoking in psoriasis patients [15]. Nevertheless, similar to other reports [29], we found that the strong association between diabetes and psoriasis is independent of obesity and smoking status. Psoriasis is associated with insulin resistance [30] and was shown to improve with administration of drugs used as insulin-sensitizers in type 2 diabetes [31]. Inflammation could be the link between the two disorders, as it can induce insulin resistance [32] by several mechanisms, among which the TNF- α mediated inhibition of insulin-mediated tyrosine phosphorylation of the insulin receptor, as well as insulin receptor substrate-1, essential for insulin signaling and glucose transportation to the cell surface [33].

Insulin resistance is itself proinflammatory [34]. Hyperglycemia induces up-regulation of adhesion molecules and, implicitly, enhances leukocyte adhesion to endothelial cells. Advanced glycation end products stimulate monocyte migration, cytokine production, oxidant stress, and increase vascular permeability and endothelial dysfunction [34]. All these could explain the benefits of antidiabetes drugs such as thiazolidinediones (pioglitazone), which are insulin-sensitizers on psoriasis [31,35].

Another hypothesis is that therapy for psoriasis, mainly systemic steroids, may promote development of diabetes. However, this kind of therapy has very few indications in psoriasis patients and is generally avoided due to its potential to exacerbate psoriasis skin lesions on withdrawal. On the other hand, use of potent topical steroids on large body surface areas for long periods of time could lead to systemic absorption of these drugs and increased risk for diabetes, although adherence with long-term dermatocorticoids use is generally low [36].

Lea, Cornish, and Block [37] were the first to report increased serum lipid levels in psoriasis patients. Since then, numerous studies confirmed the association between psoriasis and aberrant lipid and lipoprotein profiles, specifically hypertriglyceridemia, elevated plasma levels of low-density lipoprotein cholesterol (LDLc), very low-density lipoprotein cholesterol, and lipoprotein A, as well as decreased levels of high-density lipoprotein cholesterol, [9,38,39] apolipoprotein B, [9,14] and apolipoprotein A-1 [14]. Although the presence of these abnormalities could be explained by the increased prevalence of smoking, low physical exercise, higher alcohol consumption, and obesity observed in psoriasis patients, the results persisted after controlling for these factors in several studies, suggesting that the abnormal lipid profile seen in these patients might be genetically determined rather than acquired [13].

Systemic therapy used for severe psoriasis, such as retinoids, could be responsible for the significantly higher proportion of dyslipidemia in this study group [40]. Nevertheless, in our study, the results persisted when we took into account the systemic treatment regimens our patients followed and was not influenced by treatments that could increase the risk of dyslipidemia.

Once again, the relation between psoriasis and dyslipidemia is most probably a bidirectional one. Recently, the effect of lipid abnormalities on the immune system has been discussed [41]. Anti-oxidized LDL autoantibodies have been identified in the serum of psoriasis patients and their level seems to correlate with the disease severity [42], favoring the state of persistent cutaneous inflammation.

Conclusions

In summary, the results of our study indicate that patients with psoriasis have an increased risk for obesity, diabetes, and dyslipidemia. Our findings have important clinical and therapeutic implications, as well as a major impact on public health issues. Efforts should be made to identify patients at risk for these comorbidities, to implement efficient and acceptable prevention strategies and to correct all modifiable factors.

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FEEDING BEHAVIOR EVALUATION IN PERSONS WITH NEWLY DIAGNOSED TYPE 2 DIABETES MELLITUS IN SALAJ COUNTY

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Abstract

The paper analyzes the behavior and eating habits of people newly diagnosed with type 2 diabetes in Sălaj county. As a working method a questionnaire was used to assess the nutrition and eating habits; the sample chosen for the study consisted of 126 subjects. Statistical analysis of this observational study will enable the conclusion of the specific characteristics of lifestyle zone. In the studied group of 126 people, with a distribution approximately equal by sexes, over 40% were overweight and 40% were also diagnosed with abdominal obesity in various degrees. This was not a surprise after the evaluation of questionnaires and the study of the eating habits. The analysis of these questionnaires indicated that over 50% of respondents had only 3 meals a day, but over 80% did not have breakfast, though still over 50% confirmed having the daily snacks. The worrying fact was that about 80% of respondents said that the most important meal of the day for them is dinner, and about 70% said that more than half of the quantity of food consumed daily is at dinner. Also, it was noted the late hour at which dinner, 55% recognizing meal after at 22^{oo}. From all of the eating behavior disorders, over 40% of respondents did not dine in the kitchen and over 50% frequently take their meals in front of the TV. Also, this study demonstrated an increased consumption of saturated and unsaturated fat, eggs, sweets, bread and gaskets, with the unfortunate combination of the latter two at the same meal. It was alarming lower consumption of vegetables and fruits, milk and dairy products, and meat. It should be noted here that cooking with fried flour was reported in over 60% of the cases. Following nutritional imbalances such as those demonstrated in this study, we have to worry about the growing risk of developing obesity, diabetes mellitus and cardiovascular diseases.

key words: *eating behavior disorders, macronutrients, micronutrients, type 2 diabetes*

Introduction

Lifestyle, representing all individual decisions and behaviors, is found in correlation with health condition by its components that define human behavior: diet and eating behavior, body weight, physical

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