

## A Survey of Disease Severity, Quality of Life, and Treatment Patterns of Biologically Naive Patients with Psoriasis in Central and Eastern Europe

**Tamás Palotai<sup>1</sup>, Jacek C. Szepietowski<sup>2</sup>, Juraj Pec<sup>3</sup>, Petr Arenberger<sup>4</sup>, Calin Giurcaneanu<sup>5</sup>, Rolland Gyulai<sup>6</sup>, Jovan Miljkovic<sup>7</sup>, Ene Pärna<sup>8</sup>, Ingmars Mikazans<sup>9</sup>, Nauris Grusauskas<sup>10</sup>, Michal Hodik<sup>1</sup>**

<sup>1</sup>Wyeth Whitehall Medical Affairs, Vienna, Austria; <sup>2</sup>Department of Dermatology, Venereology and Allergology, University of Wrocław, Wrocław, Poland; <sup>3</sup>Department of Dermatology, Faculty Hospital, Martin, Slovakia; <sup>4</sup>FNKV Praha, Prague, Czech Republic; <sup>5</sup>Dermatology and Allergology Clinic, Elias Emergency University Hospital, Bucharest, Romania; <sup>6</sup>Department of Dermatology and Allergology, University of Szeged, Szeged, Hungary; <sup>7</sup>Department of Dermatovenereology, Maribor University Clinical Center, Maribor, Slovenia; <sup>8</sup>University Department of Dermatology, Tartu University Hospital, Tartu, Estonia; <sup>9</sup>P. Stradins Clinical University Hospital, Riga, Latvia; <sup>10</sup>Kaunas Second Clinical Hospital, Kaunas, Lithuania

### Corresponding author:

Tamás Palotai, MD, MBA  
GHZ - Eisenstadt  
Robert-Graf-Platz 2  
A-7000 Eisenstadt  
Austria  
[tamas.palotai@chello.at](mailto:tamas.palotai@chello.at)

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**SUMMARY** Because data on the epidemiology of psoriasis in central and eastern Europe are scarce, a survey was carried out among dermatologists in the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. The objective of the survey was to determine disease severity, treatment patterns, proportions of dermatologists considering their patients' current treatments unsatisfactory, and proportions of physicians intending to prescribe biologicals to their patients. Data collection was based on physician- and patient-completed questionnaires. Data on 913 patients were available. The mean age at onset of psoriasis was 29±15 years, mean proportion of affected body surface area 29%±22%, mean Psoriasis Area and Severity Index (PASI) 15±12, and mean Dermatology Life Quality Index (DLQI) 11±7. Overall, 37% of patients had severe disease defined as a PASI of 10 or more and a DLQI above 10; 45% of all patients and 58% of patients with severe disease had received standard systemics. In 53% of cases, dermatologists were dissatisfied with their patients' treatments. In almost all of these patients, physicians considered switching treatments, and in 65% of these patients, or more than 30% of the entire patient sample, physicians considered switching to biologicals, suggesting that nonbiologic treatment options in this group had been exhausted. Significant between-country differences were found for most study parameters. This survey was the first to assess the profile of patients with psoriasis in countries of central and eastern Europe. Psoriasis has a substantial impact on the quality of life, regardless of disease severity. More than one third of patients had severe disease, more than half of patients were considered by their physicians to be receiving inappropriate treatment, and in more than one third of patients physicians intended to switch to biologicals.

**KEY WORDS:** psoriasis, disease severity, quality of life, biologicals, anti-TNF therapy, TNF-alpha inhibitors, patient profile

## INTRODUCTION

Psoriasis is a chronic relapsing inflammatory skin disease affecting some 125 million people worldwide, or 2%-3% of the population (1,2). Whereas men and women are equally affected (1), there is considerable interracial variation in the incidence of the disease. For example, psoriasis is more common among Caucasians than among African Americans or Asians (3-5). Between 20% and 30% of all patients with psoriasis have severe disease, often requiring systemic therapy (6). Regardless of disease activity, psoriasis can severely affect the patient's quality of life in terms of both psychological and physical well-being, comparable with that seen in cancer, ischemic heart disease, or diabetes (7-11).

Because standard systemic treatments for severe psoriasis are associated with potentially serious toxicity and many patients have treatment-resistant disease (12), alternative treatments have been developed over the past years. These novel biological therapies, which inhibit specific molecular steps in the pathogenesis of psoriasis through different modes of action, are licensed for the treatment of adults with moderate to severe plaque psoriasis failing to respond to or having contraindications to other systemic therapy.

Because biologicals are relatively costly and knowledge about their long-term efficacy and tolerability is still limited, guidelines have been developed to support their safe and effective use (6,13-17). There is a consensus that treatment of psoriasis be guided by a stepwise approach, with topical treatment recommended for mild psoriasis, systemic therapy in patients no longer responding adequately to topical treatment or phototherapy, and biologicals in patients not responding to or having contraindications for classical systemics.

Whereas traditional measures of psoriasis severity have concentrated on the physical aspects of the disease, such as the Psoriasis Area and Severity Index (PASI), the subjective distress of the patient is increasingly considered an integral part of overall severity assessment (8,9,18-23). This is also reflected in current treatment guidelines for psoriasis. For example, the guideline by the British Association of Dermatologists (BAD), the only guideline so far dealing exclusively with biologicals in psoriasis, defines severe psoriasis as a PASI score of 10 or more plus a Dermatology Life Quality Index (DLQI) above 10 (6).

The epidemiology of plaque psoriasis in central and eastern Europe is not well documented,

in part because psoriasis patient organizations, which have existed for many years in western Europe (24,25) and North America (26) and have been actively involved in documenting the burden of the disease, improving access to care, and raising awareness of the psychosocial needs of psoriasis patients, are only now beginning to evolve in eastern Europe (27). Health care delivery systems in eastern Europe differ from those in western Europe or North America (28), which is why epidemiological data may not be directly transposable between regions. Therefore, the purpose of this cross-sectional epidemiological evaluation was to collect systematic data on the severity of psoriasis and on the therapeutic strategies currently employed by practicing dermatologists in the countries of central and eastern Europe. Also, we asked how many dermatologists considered their patients' current treatments unsatisfactory and how many physicians intended prescribing biologicals to their patients. The results of this survey are expected to provide first insights into the burden of psoriasis in central and eastern Europe, which may be relevant for the development of treatment guidelines designed to ensure effective and common treatments across Europe.

## METHODS

Between September and December 2008, dermatologists from the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia who were experienced in caring for patients with psoriasis were invited to collect data on patients with plaque psoriasis. Each dermatologist was to evaluate at least 5 consecutive patients with a diagnosis of plaque psoriasis not previously treated with a biological to determine whether the treatment these patients were receiving was satisfactory, and, if not, whether they would consider initiating treatment with biologicals in general and TNF-alpha inhibitors in particular. Data collection was based on questionnaires filled in by both the physician and the patient during each patient's visit and on review of the patient's medical records. To be included in the survey, patients had to have a diagnosis of plaque psoriasis established by a dermatologist before the study visit, and they had to be 18 years of age or older at the time of the visit. Patients already treated with biologicals were excluded.

## Outcome variables

Data on the demographic and clinical profile included patient age at the time of the visit, sex,

family history of psoriasis or arthritis, prior and concomitant diseases, patient age at the onset of symptoms and at the time of diagnosis, prior enthesitis, enthesopathies, arthritis diagnosed by a rheumatologist, and disease location. Data on resource use were numbers of hospitalizations or surgeries for psoriasis, visits to specialized outpatient clinics, and spa treatments.

Disease assessment was based on the location of psoriasis, the proportion of the affected body surface area (%BSA) as determined by the handprint method or the rule of nines, and PASI. A PASI score of 10 or more correlates well with a series of indicators generally associated with severe disease (6,14,29), such as the need for hospital admission or systemic therapy (29). The investigator's global assessment of disease activity was determined using a Visual Analog Scale (VAS) of 0-100 mm. Quality of life was evaluated using the 10-item DLQI (30), a self-administered validated tool for measuring quality of life across all skin diseases (29,31), with scores above 10 indicating a very or extremely large effect on the patient's life. Also, we determined the proportion of patients with severe disease as defined by the combined BAD criterion of a PASI score of 10 or more plus a DLQI above 10. We chose this definition for severe disease because, according to the BAD guidelines for the use of biological interventions in psoriasis, patients with a PASI score of 10 or more plus a DLQI above 10 are eligible for treatment with biologicals (6).

Topical, phototherapy, and systemic treatments for psoriasis received by the patients within the past 3 years prior to or at the time of the study visit were also recorded. Finally, dermatologists documented whether they were satisfied or dissatisfied with the therapies their patients were receiving at the time of the visit, their plans for change, their willingness to prescribe biologicals in general and TNF-alpha inhibitors in particular, and the reasons for or against prescribing TNF-alpha inhibitors.

### Statistical analysis

A sample size of 800 was considered appropriate to allow for representative determination of the profile of psoriasis patients consulting a dermatology office, permitting estimates of binominally distributed outcomes with a precision, based on nominal 95% confidence limits, between  $\pm 3.5\%$  for an observed rate of 50% and  $\pm 2.1\%$  for an observed rate of 10%. All data were analyzed descriptively. For each variable, summary statis-

tics are presented, including the number of data points, mean, standard deviation, median, minimum, and maximum values for continuous variables and rates and proportions for categorical and ordinal variables. Statistical tests and the corresponding *P* values are regarded as exploratory and not as confirmatory tests of hypotheses. Statistical tests were one-way analyses of variance for comparison of several groups or countries and quantitative data, followed by t-tests if significance was achieved in the one-way analysis of variance overall group effects, controlled by Kruskal-Wallis H-tests and subsequent Wilcoxon-Mann-Whitney U-tests as non-parametric methods. In case of two groups of quantitative data, we used the t-test for independent groups, again controlled by Wilcoxon-Mann-Whitney U-test. Categorical or ordinal data were assessed by standard  $\chi^2$ -tests in R by C contingency tables. All correlation coefficients presented are based on the method of Pearson.

## RESULTS

Between September and December 2008, 47 dermatologists recruited 933 patients with plaque psoriasis into the survey, 20 of whom were excluded from the analysis because they did not meet the inclusion criteria. Thus, data on 913 patients with psoriasis were available (Table 1). Because sample sizes in Estonia, Latvia, and Lithuania were too low to allow for meaningful statistical interpretation, data for the three Baltic countries are presented together.

### Demographic and clinical profile of study patients

The demographic and clinical characteristics of the patients by country are shown in Table 1. Almost 60% of patients were men. The mean patient age at the time of the visit was 46.8 years. The mean and median age at the onset of psoriasis symptoms was 29.1 and 26 years, respectively, ranging from 1 to 79 years. The time elapsed between disease onset and first diagnosis in the study countries ranged between 0 and 2 years.

Out of 913 patients, 222 (24%) reported a parental history of psoriasis, 114 (12%) reported siblings suffering from psoriasis, and 169 (19%) reported that some other family member was affected by psoriasis. Prior or current comorbidities were recorded in 572 (63%) patients and included hypertension (n=285; 31%), obesity (n=145; 16%), liver disease (n=99; 11%), gastrointestinal disease (n=80; 9%), atherosclerosis (n=62; 7%), type 2

**Table 1.** Demographic characteristics and disease history of patients with plaque psoriasis by country

Country	n	Sex (male) n (%) <sup>b,e</sup>	Age at visit (yrs) <sup>a,b</sup>	Age at onset of symptoms (yrs) <sup>a,c</sup>	Age at the time of diagnosis (yrs) <sup>a,c</sup>
Baltics <sup>d</sup>	45	21 (50)	49.5 (14.2)	31.4 (15)	32.7 (15.2)
Czech Republic	156	95 (62.5)	45.3 (14.7)	25.6 (14.3)	26.5 (14.5)
Hungary	123	71 (59.2)	49.1 (11.9)	33.1 (14.8)	33.7 (15.3)
Poland	210	123 (61.2)	47.9 (15.2)	28.5 (16.2)	29.5 (16.2)
Romania	155	101 (66.4)	47.1 (14.2)	33 (15.4)	34.3 (15.7)
Slovakia	175	89 (51.4)	43.8 (14.9)	26.8 (14)	27.6 (14.1)
Slovenia	49	20 (42.6)	48.3 (13.3)	26.6 (13.6)	27.5 (14.4)
Total	913	520 (58.6)	46.8 (14.4)	29.1 (15.2)	30.1 (15.4)

<sup>a</sup>Values are expressed as mean (SD); <sup>b</sup>significant between-country difference ( $P<0.05$ ); <sup>c</sup>significant between-country difference ( $P<0.001$ ); <sup>d</sup>in Estonia, Latvia, and Lithuania, 15 patients each were included; <sup>e</sup>numbers may not add up to 100%.

diabetes mellitus (n=65; 7%), and heart insufficiency (n=57; 6%). Less common comorbidities included acne, kidney disease, depression, bronchial asthma, and tuberculosis. A history of enthesitis or arthritis diagnosed by a rheumatologist was reported by 147 (16%) and previous enthesopathies by 94 (10%) patients. Psoriatic arthritis diagnosed by a rheumatologist was present in 132 (14%) patients. With the exception of hypertension, obesity and diabetes mellitus, there were significant between-country differences in the proportions of patients with comorbidities.

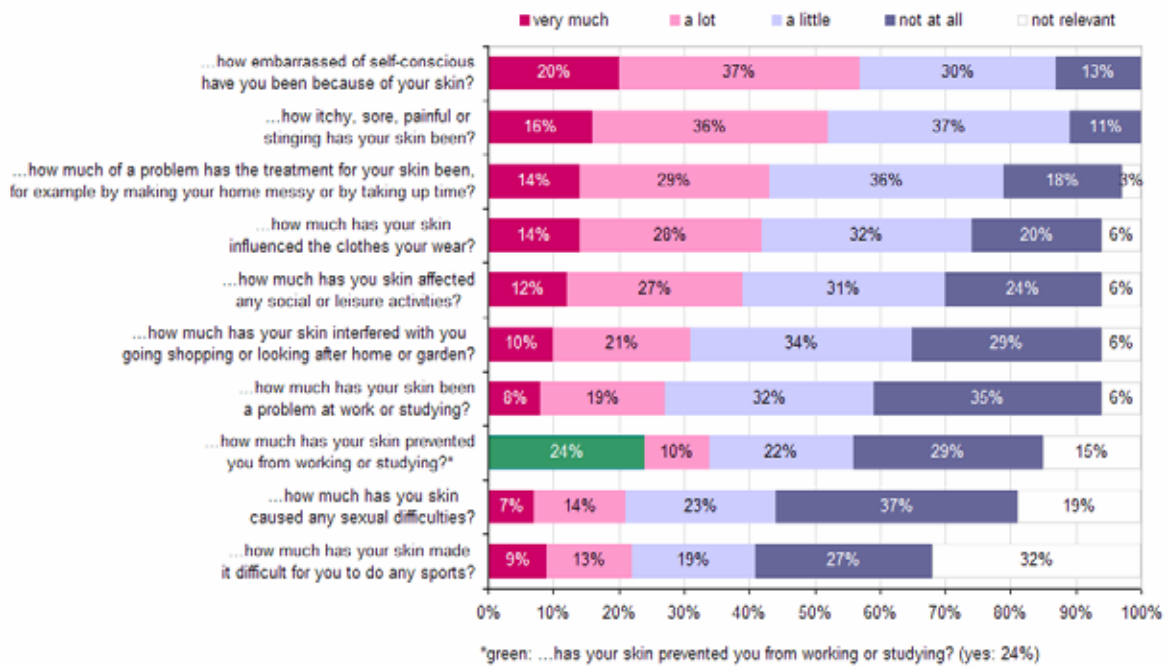
The body parts most commonly affected by psoriasis at the time of the patient visit were the arms (88%), legs (88%), trunk (77%), scalp (73%), nails (43%), and either hands or feet (36%), followed by the face (21%) and the genital region (17%). In the majority of patients, multiple body parts were affected.

Results on the disease severity indices are summarized in Table 2. The mean proportion of the affected body surface area in the surveyed patient sample was 29% (median, 23%), mean PASI was 15 (median, 12), and mean DLQI was 11 (median,

**Table 2.** Proportion of body surface area affected (%BSA), Psoriasis Area and Severity Index (PASI), Dermatology Life Quality Index (DLQI), Visual Analog Scale (VAS), and physicians' satisfaction with treatments their patients were receiving

Country	%BSA <sup>*</sup>		PASI (0-72) <sup>*</sup>		DLQI (0-30) <sup>*</sup>		VAS (0-10 cm) <sup>*</sup>		Physicians dissatisfied with their patients' treatments n (%) <sup>**</sup>
	Mean (SD)	Median (range)	Mean (SD)	Median (range)	Mean (SD)	Median (range)	Mean (SD)	Median (range)	
Baltics	39.5 (27.1)	34 (4-99)	23.2 (17.8)	15.3 (1.5-57.2)	9.7 (6.4)	9 (0-26)	58.4 (22.4)	58 (12-94)	16 (35.6)
Czech Republic	30.5 (20)	25.5 (1-87)	14 (10)	11.7 (0.3-58.4)	10.9 (6.4)	11 (0-29)	45.4 (25.4)	45.5 (3-97)	93 (59.6)
Hungary	28 (18.4)	26 (1-90)	14.6 (10.3)	12 (0.6-47.2)	9.7 (6.9)	9 (0-30)	39.9 (23.9)	35 (4-100)	76 (61.8)
Poland	28.2 (19.7)	22 (2-99)	13 (9)	11.9 (1-58.2)	10.8 (6)	10 (1-29)	38.9 (23)	36.5 (2-98)	84 (40.2)
Romania	36.9 (26.9)	29 (1-98)	20.2 (14.3)	17 (0.4-61.6)	14.4 (7.6)	15 (0-30)	56.1 (26)	60 (5-100)	104 (67.1)
Slovakia	21.1 (17.3)	17 (0.5-94)	13.4 (11.3)	10.5 (0.4-55.2)	11.4 (7.4)	11 (0-27)	38 (23.2)	36 (2-90)	75 (42.9)
Slovenia	17 (14.2)	13 (1-79)	6.7 (6.2)	4.8 (0.8-35.2)	11.2 (7.1)	9 (0-29)	41.8 (25.6)	43 (3-90)	34 (69.4)
Total	28.7 (21.5)	23 (0.5-99)	15 (11.8)	12 (0.3-61.6)	11.4 (7)	11 (0-30)	44 (25.2)	41 (2-100)	482 (52.9)

<sup>\*</sup>Significant between-country differences ( $P<0.001$ ); <sup>\*\*</sup>numbers may not add up to 100%;



**Figure 1.** Quality of life results using Dermatology Life Quality Index (DLQI): In the past week, ...

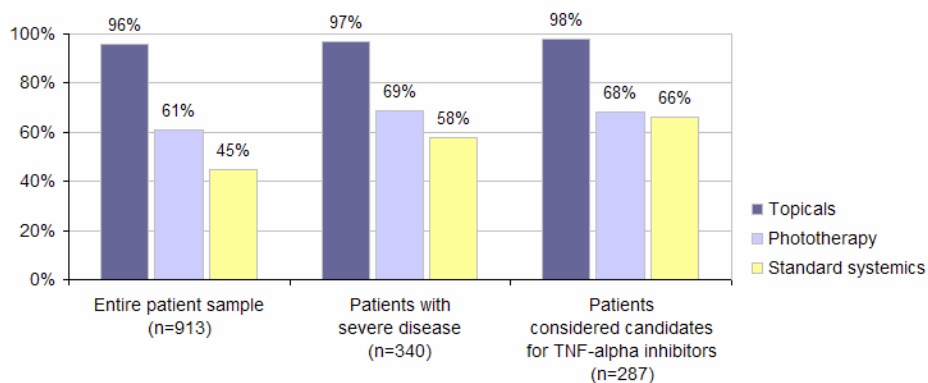
11), again with significant between-country differences for all parameters. Out of 913 patients, a %BSA above 10 was recorded in 706 (77%), PASI of 10 or more in 539 (59%), and DLQI above 10 in 467 (51%) patients. Based on the BAD definition of severe disease, i.e. a PASI score of 10 or more plus a DLQI above 10 (6), 340 (37%) patients had severe disease.

Quality-of-life results are illustrated in Figure 1. Of the 10 DLQI items, the most prevalent concerns referred to the patients being embarrassed about their disease and being affected by itching; 24% of patients reported that psoriasis prevented them from working or studying.

The 3 disease severity variables, %BSA, PASI, and DLQI, showed significant inter-correlations. The strongest correlation was found between the physician-assessed variables %BSA and PASI, with a product moment correlation coefficient of  $r=0.83$  ( $P<0.001$ ). PASI and DLQI yielded a correlation coefficient of  $r=0.39$ ; %BSA and DLQI  $r=0.40$ ; DLQI and VAS  $r=0.46$ ; and PASI and VAS  $r=0.65$  ( $P<0.001$  all).

### Past and current psoriasis treatments

On an average, patients had been hospitalized 5 times for the treatment of psoriasis (Table 3). Ninety-five (10%) patients had undergone surgery for psoriasis, 310 (35%) had consulted specialized



**Figure 2.** Past or current treatments according to treatment class in total patient sample (N=913), patients with severe disease (n=340), and patients considered candidates for TNF-alpha inhibitor therapy (n=287)

**Table 3.** Utilization of health care resources

Country	No. of hospitalizations*		Surgery for psoriasis (yes)*	Visits to specialized outpatient clinics (yes)*	No.** of spa treatments*		
	Mean (SD)	Median (range)	n** (%)	n** (%)	0	1–4	>4
Baltics	6.4 (9.4)	3 (0-50)	0	24 (54.5)	32 (71.1)	7 (15.6)	6 (13.3)
Czech Republic	4.6 (6.6)	2 (0-30)	11 (7.1%)	52 (33.8)	106 (67.9)	38 (24.4)	12 (7.7)
Hungary	2.7 (4.9)	1 (0-30)	14 (11.4)	36 (29.5)	94 (76.5)	11 (8.9)	18 (14.6)
Poland	6.2 (9.5)	2 (0-60)	4 (1.9)	54 (26.7)	147 (70)	50 (23.8)	13 (6.2)
Romania	7.3 (13.1)	3 (0-90)	19 (12.3)	19 (12.3)	116 (74.8)	22 (14.2)	17 (11)
Slovakia	2.6 (4.3)	1 (0-32)	47 (26.9)	95 (55.6)	87 (49.7)	68 (38.9)	20 (11.4)
Slovenia	1.8 (4.5)	0 (0-30)	0	30 (61.2)	37 (75.6)	6 (12.2)	6 (12.2)
Total	4.7 (8.6)	2 (0-90)	95 (10.4)	310 (34.6)	619 (67.8)	202 (22.1)	92 (10.1)

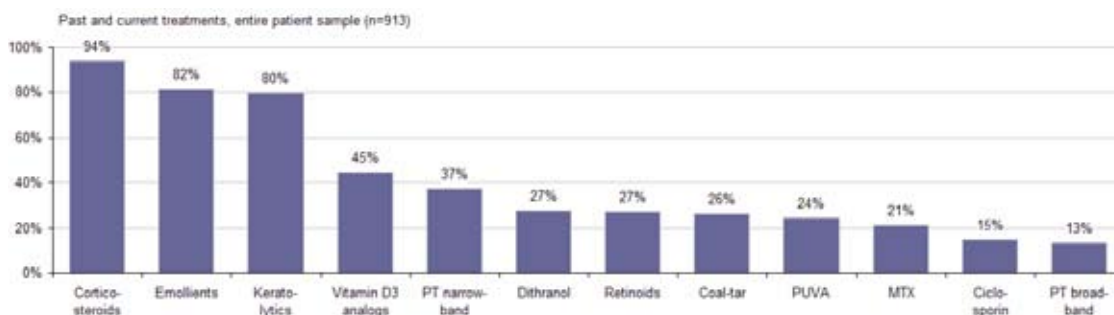
\*Significant between-country differences ( $P < 0.001$ ); \*\*numbers may not add up to 100%.

clinics, 202 (22%) had received between 1 and 4 spa treatments, and 92 (10%) patients had undergone more than 4 spa treatments. There were significant between-country differences in resource utilization (Table 3).

Out of 913 patients, 873 (96%) had received topical treatments within the past 3 years up to or at the study visit, 558 (61%) had received phototherapy, and 412 (45%) had received standard systemics (Fig. 2). Among the 340 patients with severe disease, the proportions of patients having received phototherapy and standard systemics were only slightly higher than in the overall population (Fig. 2).

The treatments the patients had received over the past 3 years before or at the time of the study visit are shown in Figure 3. For current treatments, the weekly or monthly treatment dosages or frequencies were translated into low and high treatment intensities based on the documented median value of the therapy in question (Fig. 3). The 3 most frequent past or current treatments were corticosteroids, emollients, and keratolytics, followed by vitamin D3 analogs, narrowband ultraviolet B phototherapy, and dithranol. At the time of the study visit, almost half of the patients treated with corticosteroids were receiving high-dose

A



B



**Figure 3.** Past and current treatments for psoriasis

**Table 4.** Disease severity and quality of life according to treatment satisfaction in total patient sample (N=913)

	Satisfied (n=430) <sup>c,d</sup>	Not satisfied (n=482) <sup>c,d</sup>	Candidates for TNF-alpha inhibitors (n=287)
%BSA <sup>a</sup>	22 (19.1)	34.6 (21.9)	39 (21)
PASI <sup>a</sup>	11.3 (10.4)	18.9 (13.3)	22 (14)
DLQI <sup>a</sup>	8.7 (6.1)	13.7 (6.9)	15 (7)
VAS (mm) <sup>a</sup>	34 (23)	52 (23)	60 (21)
Patients with severe disease <sup>b</sup>	85 (25%)	255 (75%)	179 (62%)

<sup>a</sup>Data are given as mean (SD); <sup>b</sup>data are given as n (%); severe disease defined by PASI score of 10 or more and DLQI above 10 (6); <sup>c</sup>P value for all differences between satisfied and not satisfied:  $P < 0.001$ ; <sup>d</sup>data on satisfaction missing for 1 patient; %BSA = proportion of body surface area affected; PASI = Psoriasis Area and Severity Index; DLQI = Dermatology Life Quality Index; VAS = Visual Analog Scale.

therapy. There were some important between-country differences in the treatments prescribed. For example, the use of methotrexate was highest in the Baltic countries and Romania and lowest in Slovakia. The use of cyclosporine was highest in Slovakia, while the use of dithranol was highest in Poland.

### Treatment satisfaction

The dermatologists of 482 (53%) patients considered the treatment their patients were receiving at the time of the survey unsatisfactory. Of these 482 patients, 255 (53%) had severe disease. Out of the 430 patients receiving satisfactory treatment, 85 (20%) had severe disease (Table 4). Patients whose physicians were not satisfied with their current treatments had a significantly higher proportion of body surface affected by psoriasis and significantly higher PASI, DLQI, and VAS scores. Important between-country differences were observed with respect to the physicians' dissatisfaction with the treatments their patients were receiving (Table 2).

### Willingness to switch to alternative treatments

Out of the 482 (53%) patients whose physicians were dissatisfied with their patient' treatments, a treatment switch was intended in 460 (95%) patients. Of these, 40 (9%) patients would be switched to topical therapy, 93 (20%) to phototherapy, 99 (22%) to standard systemic therapy, and 312 (68%) to biologicals. Almost all of the dermatologists intending to switch to biologicals said they considered switching to TNF-alpha inhibitors (287/312; 92%). The disease severity and quality of life of candidates for TNF-alpha inhibitor therapy are shown in Table 4.

The treatments that candidates for TNF-alpha

inhibitors were receiving at the time of the study visit are presented in Figure 2. As many as 282 of 287 (98%) candidates had received topical treatments within the past 3 years up to and at the study visit, 194 (68%) had received phototherapy, and 190 (66%) had received standard systemics.

The reasons given for intending to switch to TNF-alpha inhibitors were disease severity (183/287; 64%), inefficacy of other medications (173/287; 60%), the possibility of continuous therapy (167/287; 58%), the risk of toxicity with standard therapy (129/287; 45%), the likelihood of improved patient compliance (119/287; 41%), or comorbidities precluding standard therapies (35/287; 12%). Other, less commonly cited reasons were the convenience of therapy that affords patients more free time, psoriasis primarily affecting the scalp, face or hands, the presence of psoriasis arthritis, psychological reasons, or the prospect of improving the quality of life of young patients.

Among the 25 patients not considered candidates for TNF-alpha inhibitor therapy, the reasons given were the risk of side effects, low disease activity, additional information on TNF-alpha inhibitors being required, high drug costs or lack of reimbursement, lack of patient compliance, absence of psoriatic arthritis, other systemic treatment options not yet exhausted, or pregnancy.

### DISCUSSION

The goal of this study, carried out in an unselected sample of 913 adult patients with the diagnosis of psoriasis treated in a secondary care setting, was to obtain a first general snapshot of the epidemiology of psoriasis in central and eastern Europe. Generally, the characteristics of our sample were typical of a population of psoriasis patients (1,22,32).

The median age at the time of the first symptoms was 26 years, with the usual age of onset reported to be 20-35 years (1). About one third of the patients in our survey had severe disease (6), and 15% had psoriatic arthritis. Whereas earlier reports had estimated the prevalence of arthritis in psoriasis patients to lie between 5% and 10% (33-35), more recent reports have found psoriatic arthritis to occur in 15%-30% of patients (18,23,35-38). Comorbidities in our study included hypertension, obesity, atherosclerosis, diabetes mellitus, and heart insufficiency. While comorbidities resulting from chronic inflammatory disease have been convincingly shown in patients with rheumatoid arthritis, data on psoriasis had until recently been scarce (38). There is evidence that patients with psoriasis also are at an increased risk of hypertension, obesity, diabetes, dyslipidemia, and chronic heart disease (38-40). The only comorbidities for which no significant between-country differences were found in our study were hypertension, obesity, and diabetes mellitus, underscoring the universal nature of these comorbidities.

Any assessment of the true impact of psoriasis on the patient's life requires a combination of objective disease severity measures and indicators of the patient's subjective well-being. In our sample, the mean PASI was 15 and mean DLQI 11. More than half of the patients ( $n=539$ ; 59%) had a PASI of 10 or more, indicating severe disease. At the same time, more than half of the patients ( $n=467$ ; 51%) had a DLQI above 10, i.e. psoriasis had an extremely or a very large effect on their lives. Overlap of the two criteria, i.e. meeting the British definition of severe disease of a PASI score of 10 or more and DLQI above 10, was recorded in only one third of patients ( $n=340$ ; 37%). The finding that physical measures of disease severity did not consistently reflect the overall level of psychological disability is also supported by the correlation we found between PASI and DLQI, which, although significant, was incomplete. Previous studies also found discordance between the severity of physical disease and the degree of psychological stress (8,9,18-23). According to Zachariae *et al.*, PASI may not be a significant predictor of the quality of life, even when PASI scores correlate with patient-reported disease severity (20). Richards *et al.* report that psychological factors were much stronger determinants of disability in patients with psoriasis than disease severity, location, or duration (41), and some investigators have even suggested that a measure of the quality of life or psoriasis-related psychological impairment

may be more useful than an index of the clinical extent of the disease in assessing psoriasis severity (9,42).

Although the goal of this survey was to obtain general data on the epidemiology of psoriasis in central and eastern Europe, we also found considerable variations in disease severity and quality of life indicators between countries. In addition, the quality of life values did not always coincide with disease severity scores at a country level. For example, although the mean %BSA (39.5%), PASI (23.2), and VAS (58.4) scores were highest in the Baltic countries, the patient-reported quality of life was highest (DLQI, 9.7). By comparison, Romania had the second highest mean %BSA (36.9%), PASI (20.2), and VAS (56.1) values and the lowest patient-reported quality of life (DLQI, 14.4). Also, Slovakia had the second lowest %BSA (21.1%) and PASI (13.4) scores, i.e. the second lowest level of disease severity, but the patient-reported quality of life was low, as reflected in the second highest DLQI score (11.4). Physician satisfaction also showed great variability between countries. For example, in Slovenia, the country with the lowest disease severity scores, almost 70% of physicians were dissatisfied with their patients' current treatment – the highest proportion of all countries surveyed. This suggests that differences between countries may also exist in terms of patient and physician expectations and that perceptions of disease may be culturally determined.

A balanced assessment of disease severity is an essential first step in selecting a treatment strategy, helping physicians decide how to proceed with the existing treatment algorithms. Thus, psoriasis treatment should be based on a stepwise approach, rapidly progressing to phototherapy and systemic treatment in patients that are unresponsive to topical therapy (43). In patients with severe disease no longer responding to standard treatment or in those in whom standard systemics are contraindicated, biologicals may be considered.

The most common past or current treatments in this survey were topicals, followed by phototherapy and systemics. In agreement with earlier reports (22,44), the most frequently used topical treatments were corticosteroids. The use of methotrexate currently and over the past 3 years was 21%, i.e. almost double that reported in a German survey among dermatologists (10.1%) (45). In our survey, the current use of methotrexate was 11%, compared with 6.8% in the EUROPSO (23) and 5.3% in the Nordic patient surveys (46). Current and previous cyclosporine use in our study was



15%, compared with 4.8% in the German survey; current cyclosporine use was 7% in our survey, 2.1% in EUROPSO, and 1.5% in the Nordic survey. Importantly, the percentages given are mean values only and do not reflect the differences that our and previous surveys found between the countries investigated.

Of note, the treatment of patients with severe disease in our study did not differ substantially from treatments in the overall patient population. The proportion of patients with severe disease having been treated with systemics (58%), even though still rather low, was higher than that reported by other study groups. For example, in a recent survey among German dermatologists, 45% of patients with severe disease had received systemic therapy (22). Dubertret *et al.*, in their patient survey report that 21% of respondents with severe disease were using systemics at the time of the survey (23). The higher use of systemics in our survey may be related to the higher mean PASI score of 15, compared with 12 in the German survey (22) and between 7.5 and 10.5 in the Nordic countries (20). Even though the results of different studies may not be directly comparable due to different definitions of severe disease and different survey designs, a common observation is that severe psoriasis tends to be undertreated (43,44). One reason for withholding standard systemics may be the risk of adverse drug reactions. In addition, however, dermatologists may tend to refrain from prescribing systemic treatment because of uncertainties on how to initiate and monitor therapy, highlighting the need for practical treatment guidelines (47).

Overall, the use of health care resources was high in all countries surveyed, regardless of disease severity scores, suggesting that psoriasis is associated with significant health care expenditures. In addition to the standard treatment options for psoriasis, about 30% of the patients in our survey had received a least one cycle of balneotherapy. Originating in Europe, spa therapy is becoming an increasingly popular alternative for psoriasis treatment worldwide (48). The country with the highest proportion of patients having received spa treatments was Slovakia (almost 50%). In the remaining countries, this proportion was consistently between 25% and 30%.

Numbers of hospitalizations related to psoriasis were also high, with a mean of 5 hospitalizations, important between-country differences, and up to 50 or 90 hospitalizations reported for individual patients. The country with the second lowest number

of hospitalizations, Slovakia, also had the highest proportion of patients having undergone surgery for psoriasis and the highest proportion of patients having attended specialized outpatient clinics, suggesting a preference of outpatient treatment for psoriasis in this country and highlighting substantial differences in how care is delivered in the countries investigated.

In virtually all of the 482 cases where physicians were dissatisfied with their patients' current treatments, physicians envisioned a treatment switch. In about half of these patients, physicians intended to switch to topicals, phototherapy, or standard systemics. In the remaining 287 patients, physicians intended to switch to TNF-alpha inhibitors. Because TNF-alpha inhibitors are currently considered the last line of treatment, it may be assumed that the existing nonbiologic treatment options in this group of patients – making up some 30% of our entire patient sample – had already been exhausted.

This survey was based on inviting both physicians and patients to complete a questionnaire dealing with essential aspects of psoriasis, making both the physical and psychological disease burden transparent and tangible. This may have contributed to the high number of physicians re-evaluating their management strategies. In daily clinical practice, in-depth clinical and psychological work-up as used in our survey requires extra time and effort. Also, initiating biologicals does not only require extensive knowledge of available treatment options, biologicals are also more costly than traditional therapies. However, some of the costs of traditional treatments tend to be hidden, such as those for toxicity monitoring, costs of regular clinic visits, costs of working days lost (43), or the costs of hospitalization required to treat relapses (49) – the most influential cost factor (43,50). A recent economic evaluation of psoriasis has demonstrated the potential cost-effectiveness of biologicals for patients with moderate to severe plaque psoriasis (50). State-of-the-art treatment guidelines covering the entire range of available treatment modalities can provide step-by-step guidance for physicians on how best to assess the patient's burden of disease and to react adequately and swiftly in tailoring treatment to the needs of the patient and for reimbursers on how to most effectively use the health care resources available.

This epidemiological analysis has a number of limitations that should be addressed. First, our patient sample was recruited from a secondary care setting, potentially resulting in a bias towards

patients with more severe psoriasis. Second, with our study being cross-sectional in nature, it does not provide data on the long-term development of the disease or the effects of previous treatments on disease severity. Third, even though we found important differences between countries in terms of the delivery of care, treatment modalities, and patient and physician expectations, our study was designed to provide a first general profile of patients with psoriasis in central and eastern Europe; a systematic analysis of differences between countries would have been beyond the scope of this survey, which is why any reasons attempting to explain the differences we found remain speculative and will have to be elucidated in future studies.

In conclusion, this survey is the first to assess the epidemiology of psoriasis in central and eastern European countries. Its results are generally consistent with similar surveys conducted previously. At the same time, it highlights important differences between the countries surveyed. These will have to be analyzed in future investigations to support the development of treatment guidelines designed to ensure effective treatments across Europe, taking into account each country's health care system, medical requirements, and treatment traditions.

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Elida shampoo for easy combing of the hair; year 1934.  
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