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**Birgül Özkesici-Kurt,**
**Levent Dönmez*,**
**Berna Nazlım**,**
**Selen Bozkurt***,**
**Ayşe Akman-Karakaş**,**
**Ertan Yılmaz**,**
**Erkan Alpsoy****

# Defining the Natural Course of Psoriasis: A Single-Center Cohort Study of 100 Patients

## Psoriasisin Doğal Seyrinin Tanımlanması: 100 Hastadan Oluşan Tek-Merkezli Bir Kohort Çalışması

## Abstract

**Objective:** The aim of this study is to determine chronologically the occurrence of clinical forms and individual lesions of psoriasis patients.
**Methods:** A total of 100 patients (mean age 42.07±16.12 years) were included in this retrospective cohort study. Individual lesions and changes in clinic forms recorded chronologically. The patients were also assessed for accompanying comorbidities during the course of disease.
**Results:** Skin manifestations were the most frequent observed onset area of the disease (95%) and the most common clinical morphology at the onset of the disease was psoriasis vulgaris (92%). Scalp (19%) was the most frequent onset area of the disease. Clinical morphologic changes were detected in 26 patients during the course of the disease. The most common clinical morphological change was guttate psoriasis (n=17). In survival analysis, average time between the appearance of the first symptom and skin involvement, nail involvement, and articular involvement was calculated as 0.23±0.106, 5.89±1.07 and 2.25±1.10 (mean ± standard error) years, respectively. During the average 11-year disease course, two-fold increase observed in accompanying diseases.
**Conclusion:** Our study shows that psoriasis starts with the skin involvement, nail and joint involvement develop later. Psoriasis vulgaris is the most frequently observed clinical morphology; scalp is the most commonly affected skin area at the onset of the disease. Over time, the number of comorbidities accompanying psoriasis increases.
**Keywords:** Psoriasis, natural course, chronology, onset manifestation, severity, comorbidity

## Öz

**Amaç:** Bu çalışmanın amacı, psoriasis hastalarının klinik form ve bireysel lezyonlarının ortaya çıkışının kronolojik olarak belirlenmesidir.
**Yöntemler:** Bu retrospektif kohort çalışmasına toplam 100 hasta (ortalama yaş 42,07±16,12 yıl) dahil edildi. Bireysel lezyonlar ve klinik formlardaki değişim kronolojik olarak kaydedildi. Hastalar aynı zamanda hastalık süresince eşlik eden ek hastalıklar açısından da değerlendirildi.
**Bulgular:** Deri belirtileri hastalığın en sık gözlemlenen başlangıç alanıydı (%95) ve hastalığın başlangıcında en sık gözlenen klinik morfoloji psoriasis vulgaristi (%92). Hastalığın en sık gözlenen başlangıç yeri saçlı deriydi (%19). Hastalığın seyrinde toplam 26 hastada klinik morfolojide değişiklikler saptandı. En sık gözlenen klinik morfoloji değişikliği guttat psoriasisteydi (n=17). Sağkalım analizi sonucunda; başlangıç semptomunu takiben deri belirtilerinin çıkması için geçen ortalama süre 0,23±0,106 yıl, tırnak için 5,89±1,07 yıl ve eklem için ise 2,25±1,10 yıl idi. Ortalama 11 yıllık hastalık süresi boyunca eşlik eden hastalıklarda iki kat artış gözlendi.
**Sonuç:** Çalışmamız psoriasisin en sık deri tutulumu ile başladığını, tırnak ve eklem tutulumlarının daha sonra geliştiğini göstermektedir. Psoriasis vulgaris en sık gözlenen klinik morfoloji; saçlı deri ise hastalığın başlangıcında en çok etkilenen deri alanıdır. Psoriasiste zamanla eşlik eden ek hastalıkların sayısı artmaktadır.
**Anahtar kelimeler:** Psoriasis, doğal seyir, kronoloji, başlangıç bulguları, şiddet, ek hastalık

Adıyaman University Training and Research Hospital, Department of Dermatology and Venereology, Adıyaman, Turkey

*Akdeniz University School of Medicine, Department of Public Health, Antalya, Turkey

**Akdeniz University School of Medicine, Department of Dermatology and Venereology, Antalya, Turkey

***Akdeniz University School of Medicine, Department of Biostatistics and Medical Informatics, Antalya, Turkey

**Correspondence/ Yazışma Adresi:**
Erkan Alpsoy,
Akdeniz University School of Medicine, Department of Dermatology and Venereology, Antalya, Turkey
Phone: +90 242 249 67 06
E-mail: ealpsoy@akdeniz.edu.tr
ORCID ID: orcid.org/0000-0001-7049-0170
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## Introduction

Psoriasis is a chronic recurrent inflammatory skin disorder characterized by hyperproliferation of keratinocytes and by infiltration of activated T helper (Th)1 and Th17 cells in the (epi)dermis (1). Although there are many publications on the epidemiological features of the disease, information about the natural course of the disease is very limited (2-7). The transitions among the clinical subtypes can be seen in the course of psoriasis. Several clinical subtypes can be observed at the same time. Studies related with the initial clinical subtype/s of the disease and changes in their clinical presentations over time, initial localizations of individual lesions and disease activity are extremely limited.

In this preliminary study, we aimed to obtain the occurrence of the clinical presentations in chronologic order and individual symptoms retrospectively and determine the natural course of the disease in psoriasis patients. Emerging comorbidities during the disease course and the disease activity during the last year were also evaluated as secondary aims of this study.

## Materials and Methods

A total of 100 consecutive patients (58 female, 42 male; mean age, 42.07±16.12 years) who applied to Psoriasis Unit of Akdeniz University, Department of Dermatology and Venereology were enrolled in this retrospective cohort study, after informed consent. The study was approved by the Ethics Committee of Akdeniz University Faculty of Medicine (70904504/242).

Clinical presentations and individual symptoms of the disease and changes in clinical morphology were recorded in the time order of the manifestations per patient retrospectively. The symptoms appeared at the same time were recorded with the same number. If there was a marked problem in the history especially on recognition of the order or dates of the onset of symptoms, the patient was excluded from the study.

Patients were also assessed for emerging comorbidities during the disease and disease activity during the last year. Frequency, localization, morphology of individual attacks and treatments were recorded. Disease activity depending on the presence of the individual lesions of the disease during the last 12 months were grouped as follow;

| | |
|---|---|
| >9 months | continuous activity, |
| 6-9 months | long duration activity, |
| 3-6 months | medium duration activity, |
| 1-3 months | short duration activity, |
| <1 month | very short duration activity or remission. |

Patients were also divided into three groups according to their monthly income level as follow;

- Low income level; patients whose monthly income do not cover their expense,
- Moderate income level; patients whose monthly income is equivalent to their expense,
- High income level; patients whose monthly income are more than their expense.

### Statistical Analysis

Continuous variables are presented as mean±standard deviation, while categorical variables are given as percentages. The Shapiro-Wilk test was used to verify the normality of the distribution of continuous variables. Statistical analysis of clinical data between two groups consisted of unpaired t-tests for parametric data and Mann-Whitney U test analysis for non-parametric data, whereas paired sample t test or Wilcoxon signed-rank test for paired data and One-Way analysis of variance or Kruskal-Wallis tests were used to evaluate comparisons between more than two groups. In addition, to determine the average time period between the appearance of the first symptom and skin involvement, nail involvement, and articular involvement Kaplan-Meier survival analysis was used, and differences between groups were tested for statistical significance using the 2-tailed log-rank test. Analyses were performed with PASW 18 (SPSS/IBM, Chicago, IL, USA) software and two-tailed p value less than 0.05 was considered statistically significant.

## Results

In the study, the mean age at diagnosis of psoriasis was 30.73±16.69 and the mean duration of the disease was 11.04±9.36 years. Family history was found in 44% of our patients. In their personal history, 59% of patients were smokers and 13% were using alcohol. Alcohol use was statistically significantly higher in men than women ($p<0.05$). In terms of income level, the difference was not statistically significant between the genders ($p=0.535$). Demographic features and medical history of patients and their distribution according to gender are given in Table 1.

Skin was the most common onset area (95%) followed by nails (4%) and joints (1%). Plaque psoriasis was the most commonly observed clinical subtype (92%) at onset of the disease. Additionally, 4 guttate psoriasis, 1 inverse psoriasis, 1 palmoplantar pustular psoriasis, and 1 generalized pustular psoriasis were seen.

Scalp (19%) was the most commonly affected skin area at onset of the disease, followed by elbow (15%), knee (13%), trunk (10%), arm, leg and palms (8%), soles (5%), face (2%), presacral region (2%), skin folds (2%) and penis (1%) (Figure 1).

In 26 patients (17 guttate psoriasis, 3 plaque psoriasis, 3 generalized pustular psoriasis, 1 plaque and inverse psoriasis, 1 guttate and inverse psoriasis and finally 1 palmoplantar pustular and erythrodermic psoriasis), changes in clinical morphology have been obtained.

Most of patients who had guttate psoriasis either an initial clinical morphology or attack (n=25), was younger than 30 years of age (mean age: 23.36±15.01) and younger than other clinical subtypes ($p=0.010$).

The duration between the occurrence of the first symptom and the diagnosis of psoriasis was found to be 2.42±0.44 (mean ± standard error) years. This period was shorter in women than men, in single than married, widow, divorced or separate patients and in patients with no alcohol intake and only the marital status was statistically significant (Figure 2) (Table 2).

In survival analysis, average time period between the appearance of the first symptom and skin involvement, nail involvement, and articular involvement was calculated to be 0.23±0.106, 5.89±1.07 and 2.25±1.10 (mean ± standard error) years, respectively.

In this cohort, while 22% of the patients had systemic illnesses before the diagnosis of psoriasis, this ratio was 44% after the diagnosis of psoriasis. When we evaluated the ratio over all, before and/or after the diagnosis of psoriasis, it was found to be as 49%.

In the last year, 58% of patients had disease individual lesions over than 9 months, and 12% of patients for 6 to 9 months, 18% of patients for 3 to 6 months, 10% of patients for 1 to 3 months had disease individual lesions. Only 2% of patients had no disease individual lesions or had disease lesions less than a month. There was no statistically significant difference between systemic therapy, biologic agents, photo(chemo)therapy and topical therapy in terms of disease activity in the last year (p=0.132). Again, there was no statistically significant difference between men and women (p=0.515), smokers and non-smokers (p=0.894), alcohol user and not user (p=0.749) in terms of disease activity in the last year.

## Discussion

In this study, skin was the most common onset area, followed by nails and joints. In survival analysis, the mean time period between the appearance of the first symptom and skin involvement was the shortest, followed by articular involvement and nail involvement. This result, in general is consistent with the previous studies, and may confirm that the skin is the most commonly involved area at onset. T cells involved in systemic inflammation of psoriasis seem to primarily target skin (1). Genetic and/or environmental factors

**Table 1. Demographic features and medical history of patients and their distribution according to gender**

| Characteristics | | Female n=58 | Male n=42 | p |
|---|---|---|---|---|
| | | Mean/count SD/(%) | Mean/count SD/(%) | |
| Mean age ± SD | | 40.41±15.85 | 44.34±16.40 | 0.237 |
| Mean age at diagnosis ± SD | | 29.21±16.38 | 32.80±17.08 | 0.298 |
| Mean disease duration ± SD | | 10.71±8.62 | 11.50±10.39 | 0.678 |
| Smoking (%) | | 28 (48.3) | 31 (73.8) | 0.010 |
| Alcohol use (%) | | 3 (23.1) | 10 (76.9) | 0.006 |
| Income level | Low (%) | 18 (66.7) | 9 (33.3) | 0.535 |
| | Moderate (%) | 35 (55.6) | 28 (44.4) | |
| | High (%) | 5 (50.0) | 5 (50.0) | |
| Education | Illiterate-literate-graduate-secondary school graduate | 33 (56.9) | 19 (45.2) | 0.249 |
| | High school graduate-postgraduate | 25 (43.1) | 23 (54.8) | |
| Marital status | Single (%) | 16 (57.1) | 12 (42.9) | 0.914 |
| | Married (%) | 38 (55.9) | 30 (44.1) | |
| | Widow, divorced or separate | 4 (100.0) | 0 (0.0) | |
| Systemic disease | Before the disease onset (%) | 12 (54.5) | 10 (45.5) | 0.710 |
| | After the disease onset (%) | 19 (43.2) | 25 (56.8) | 0.008 |

SD: Standard deviation

**Table 2. The duration between the occurrence of the first symptom and the diagnosis of psoriasis**

| | | Mean | SE | SD | p value* |
|---|---|---|---|---|---|
| Gender | Female | 1.98 | 0.55 | 4.22 | 0.104 |
| | Male | 3.05 | 0.70 | 4.49 | |
| Marital status | Single | 0.86 | 0.25 | 1.30 | 0.020* |
| | Married, widow, divorced or separate | 3.04 | 0.59 | 4.94 | |
| Smoking | No | 1.88 | 0.51 | 3.23 | 0.157 |
| | Yes | 2.81 | 0.65 | 4.98 | |
| Alcohol use | No | 2.22 | 0.45 | 4.18 | 0.085 |
| | Yes | 3.92 | 1.54 | 5.35 | |

SE: Standard error, SD: Standard deviation
*Kaplan-Meier analysis was applied

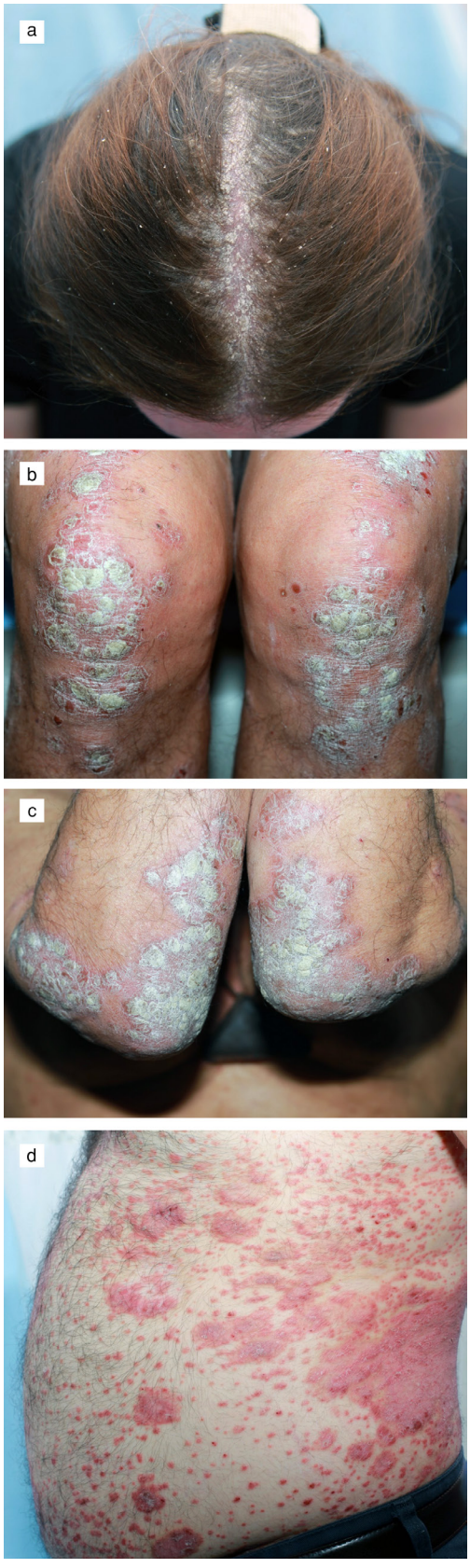


**Figure 1. a-d) Scalp was the most commonly affected skin area at onset of the disease, followed by elbow, knee and trunk**

may be taking part in additional joint or nail involvement (8,9). In the study, plaque psoriasis was the most commonly observed initial clinical morphology (92%) which is also consistent with the literature (8,10).

Changes in clinical morphology have been obtained in 26 patients and most of them have changed to guttate psoriasis. In addition, three quarters of patients who have guttate psoriasis as an initial clinical morphology (n=4) returned to plaque psoriasis in time. The patients who had guttate attacks was younger than other clinical subtypes. These data are also in line with current knowledge; plaque psoriasis attacks are observed in the future in a proportion of guttate psoriasis patients and family history of psoriasis is also frequent in the guttate psoriasis patients. This may be due to the relation between guttate psoriasis and streptococcal infection in younger age groups (2).

Scalp (19%) was the most commonly affected skin area at onset of the disease, followed by elbow (15%), knee (13%) and trunk (10%). It's known that psoriasis of the scalp develops in 75-90% of patients with psoriasis (8). But, this study indicates that scalp was the most common affected area at the onset as well as in the course of the disease. There are some reports that supports this data (6,7). Although the presacral region is frequently involved in the course of the disease, interestingly often it is not an initial area, probably due to difficulty for the patient to recognize the involvement of this area. In addition, presacral region is resistant to treatment which can also explain the relatively high frequency in the course of the disease.

Although there was no statistically significant difference between smokers and non-smokers (p=0.894), alcohol user and not user (p=0.749) in terms of disease activity in the last year in this study, there are many studies that support smoking is an independent risk factor for the development of psoriasis (11,12) and there are some studies that demonstrate the relationship between smoking and clinical severity of psoriasis (13-15). In terms of alcohol use and psoriasis severity, there are contradictory results in the literature (15,16).

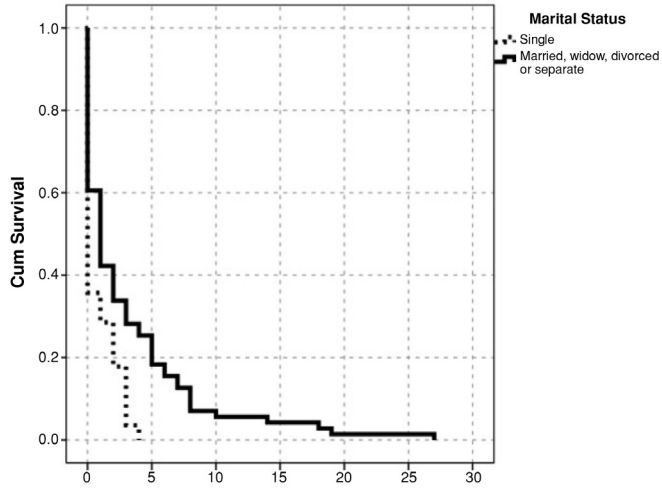


**Figure 2. The duration between the occurrence of the first symptom and the diagnosis of psoriasis**

Although, the marital status was the only statistically significant one, the duration between the occurrence of the first symptom and the diagnosis of psoriasis was shorter in women than men and in patients with no alcohol intake than alcohol user. It may be due to more apparent cosmetic concerns in women, especially in single ones and that's why women show greater success in treatment compliance than men. The women may also feel more stigmatize than men. In addition, marital status and alcohol use seems to affect referring to hospital.

In this cohort, 70% of patients had individual lesions of the disease at more than half of the last 1 year. But, our clinic is a tertiary referral hospital. So, most of the patients were recalcitrant to therapy and reaching psoriasis area and severity index 75 is considered as successful treatment (17). This data shows that the disease had continuous activity which can be involved in the development of concomitant systemic diseases. And, also a significant number of patients needed a continuous treatment. So, all of these increase the morbidity of the disease.

In our study, mean disease duration was 11 years, and comorbidities related with psoriasis have been increased two-fold during this period which agrees with currently available literature. Psoriasis is now considered as a systemic inflammatory disease, rather than a skin disease, with cardiovascular and metabolic complications (18-21). In addition, although before the onset of disease there was no statistically significant difference, after the disease onset the ratio of systemic disease is higher in men than women which is statistically significant. The risk of systemic diseases in psoriasis patients may be higher in men which can be evaluated with further studies.

### Study limitations

The study, however, has some limitations. The self-reported nature of data from volunteers may be influenced by recall bias. Furthermore, results come from a single institution and might not be generalized.

## Conclusion

Our study indicates that at onset, skin is far more frequently affected area than nails and joints. Plaque psoriasis is the most commonly observed clinical subtype, and scalp, elbow and knee are the most commonly affected skin areas at onset of the disease. During the natural course, although attacks of the disease are generally similar to original clinical subtype, guttate psoriasis was the most frequently observed change in clinical morphology. As a high incidence of comorbitidies and continuous activity has been obtained during an average of 11-year-follow-up-period in patients with psoriasis, continuous surveillance and good management of the disease is warranted. In this respect, patient-based organizations that are now allied with cognizant physicians should be encouraged.

### Ethics

**Ethics Committee Approval:** The study was approved by the Ethics Committee of Akdeniz University Faculty of Medicine (70904504/242).

**Informed Consent:** It was taken.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Concept: E.A., Design: E.A., B.Ö.K., L.D., B.N., A.A.K., Data Collection or Processing: E.A., B.Ö.K., B.N., Analysis or Interpretation: E.A., B.Ö.K., L.D., S.B., A.A.K., Literature Search: E.A., B.Ö.K., Writing: E.A., B.Ö.K., A.A.K., E.Y.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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