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Disability and Related Factors in Patients with Psoriatic Arthritis; A Single Center Study

Psoriatik Artritli Hastalarda Sakatlık ve İlgili Faktörler; Tek Merkezli Bir Çalışma

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ABSTRACT

Aim: Psoriatic arthritis (PsA) is a complex chronic inflammatory condition that may limit daily activities, with detrimental effects on patients' physical function. For patients with PsA, physical ability may be influenced by various factors. The aim of the study is to gain a more comprehensive understanding of the effects of PsA on disability and the factors that contribute to impaired physical function.

Materials and Methods: The study was a cross-sectional survey conducted with patients diagnosed with PsA according to the classification criteria for PsA at a single tertiary center. Demographic, social, and disease-related characteristics were collected. Both univariate and multivariable analyses were used to evaluate characteristics that might be associated with disability.

Results: A total of 214 patients with PsA (67.3% of whom were female; mean age ± standard deviation, 52.2±12 years) were included in the study. The median (interquartile range) health assessment questionnaire-disability index (HAQ-DI) for the patient group was HAQ median (interquartile range 25-75) 0.32 (0.00-1.10), and 31.8% of patients had moderate-to-high disability. HAQ-DI scores were correlated with disease activity, function, and quality of life measurements. Patients with disabilities were predominantly women, of advanced age, and had higher body mass index and lower education levels. In addition, enthesitis, axial involvement, tender joints, nail involvement, and serum C-reactive protein level were found to be associated with disability in univariate analysis. In regression analysis, tender joint count [odds ratio (OR): 1.07, 95% confidence interval (CI): 0.02-1.12], nail involvement (OR: 2.09, 95% CI: 1.05-4.13; p=0.035), and enthesitis (OR: 2.25, 95% CI: 1.13-4.48; p=0.021) were the main determinants of disability in patients with PsA.

Conclusion: Approximately one-third (31.8 %) of patients with PsA had disability according to HAQ-DI. PsA was intimately associated with disease involvements irrespevtive of duration of psoriazsis.

Keywords: Psoriatic arthritis, function, disability

ÖZ

Amaç: Psoriatik artrit (PsA), hastaların günlük aktivitelerini kısıtlayabilen ve fiziksel işlevleri üzerinde olumsuz etkilere yol açabilen karmaşık bir kronik enflamatuvar durumdur. PsA hastalarının fiziksel yetenekleri çeşitli faktörlerden etkilenebilir. Çalışmanın amacı, PsA'nın engellilik üzerindeki etkileri ve fiziksel işlev bozukluğuna katkıda bulunan faktörler hakkında daha kapsamlı bir anlayış kazanmaktır.

Gereç ve Yöntem: Çalışma, kesitsel bir araştırma olup, tek bir üçüncü basamak merkezde PsA sınıflandırma kriterleri temelinde PsA tanısı almış hastalarla yürütülmüştür. Demografik, sosyal ve hastalıkla ilgili özellikler toplanmıştır. Engellilikle ilişkili olabilecek özellikleri değerlendirmek için hem tek değişkenli hem de çok değişkenli analiz kullanılmıştır.

Bulgular: Çalışmaya 214 PsA hastası (%67,3'ü kadın, ortalama yaş ± standart sapma 52,2±12 yıl) dahil edildi. Hasta grubunun ortanca (çeyrekler arası aralık) sağlık değerlendirme anketi-engellilik indeksi (HAQ-DI) değeri HAQ medyan (çeyrekler arası aralık 25-75): 0,32 (0,00-1,10) idi ve

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hastaların %31,8'inde orta-yüksek düzeyde engellilik vardı. HAQ-DI skorları hastalık aktivitesi, fonksiyon ve yaşam kalitesi ölçümleriyle ilişkiliydi. Engellilik yaşayan hastalar ağırlıklı olarak kadındı ve ileri yaştaydı, ayrıca daha yüksek vücut kitle indeksi ve daha düşük eğitim seviyesine sahiptiler. Ayrıca entezit, aksiyel tutulum, hassas eklem, tırnak tutulumu ve serum C-reaktif protein düzeyinin engellilikle ilişkili olduğu bulundu. Regresyon analizinde hassas eklem [olasılık oranı (OO): 1,07, %95 güven aralığı (GA): 0,02-1,12)], tırnak tutulumu (OO: 2,09, %95 GA: 1,05-4,13; p=0,035), entezit (OO: 2,25, %95 GA: 1,13-4,48; p=0,021) ve PsA'lı hastalarda sakatlığın başlıca belirleyicileriydi.

Sonuç: HAQ-DI'ya göre PsA'lı hastaların üçte biri engelliydi. PsA sedef hastalığı dsüresinden bağımsız olarak yaşam kalitesi, fonksiyon ve aktivitelerle yakından ilişkiliydi.

Anahtar Kelimeler: Psöriatik artrit, fonksiyon, sakatlık

INTRODUCTION

Psoriatic arthritis (PsA) is a complex chronic inflammatory disease characterized by several symptoms, including axial involvement, peripheral arthritis, enthesitis, dactylitis, and skin psoriasis[1]. PsA typically manifests between the ages of 30 and 55, affecting approximately 0.3-1% of the general population and 5-30% of psoriasis patients[2]. Its influence on quality of life is extensive, presenting with symptoms of pain, exhaustion, sadness, anxiety, diminished physical function, reduced social involvement, disability, and loss of employment[3,4]. Assessment of the outcomes is important in both clinical practice and in a trial setting to enable evaluation of disease activity and treatment effects. On the other hand, physical function and disability are fundamental metrics of patient-reported disease impact, as shown in randomized controlled trials, longitudinal observational studies, and clinical practice[5]. A well-validated patient self-report questionnaire for the evaluation of physical function in rheumatic diseases is the health assessment questionnaire-disability index (HAQ-DI)[6]. Nevertheless, the process is time-consuming, and the scoring can be intricate. The scoring method may result in the comparison of various activities from visit to visit, and scores can also be artifactually elevated when aids are used, despite the improvement in patient function[7]. Therefore, it is crucial to illustrate the relationship between the results of the HAQ-DI questionnaire and patient and disease-related features. In the current study, our objective was to investigate the prevalence of disability in patients with PsA, the correlation between disability and various patient-reported outcomes, and the relationship between disability, demographic variables, and other disease-related features.

MATERIALS AND METHODS

Patients and Data Collection

All patients with PsA were aged 18 years and older, in accordance with the classification criteria for PsA (CASPAR). Patients from the PsA cohort of İzmir Katip Çelebi University, Rheumatology Clinic, were included in the study from 15 August 2023 to 16 October 2024[8]. Demographic features, smoking history, educational level, and disease-related characteristics were collected. The subsequent components of the disease were assessed: disease activity with the disease activity index for psoriatic arthritis (DAPSA)[9], PsA disease activity score (PASDAS)[10], the tender joint count (TJC), swollen joint count, and leeds enthesitis index[11]; functional status with the bath ankylosing spondylitis functional index (BASFI)[12]; disease-related quality of life with the short-form 36 (SF-36) questionnaire[13] and dermatology life quality index (DLQI)[14]; and psoriasis severity with body surface area. HAQ-DI was used to evaluate disability[15]. The HAQ-DI contains 20 questions that are divided into eight categories: dressing and grooming, hygiene, arising, reach, eating, grip, walking, and outside activities. Each item has four response possibilities, ranging from "no difficulty" to "unable to do", corresponding to scores from 0 to 3. Better function is indicated by lower HAQ-DI scores. In our investigation, we defined moderate-to-high disability as a score of 1 or greater. This study was approved by the Ethics Committee of İzmir Katip Çelebi University (decision no: 0411, date:11.09.2023). The research was performed in compliance with the principles of the Declaration of Helsinki.

Statistical Analysis

Both analytical (Kolmogorov-Smirnov or Shapiro-Wilk) and visual (histograms, probability plots) techniques were used to examine the distribution of continuous variables. Values were displayed as percentages for categorical variables and as the mean and standard deviation (SD) or median and interquartile range for continuous variables. Normally distributed variables were compared between the groups using the Student's t-test, while non-normally distributed variables were compared using the Mann-Whitney U test. To compare categorical data, the chi-square test and Fisher's exact test were used. The factors linked to disability were evaluated using binary logistic regression analysis. Demographic and/or disease-related variables were initially selected based on a univariable analysis with a significance level of $p<0.05$, as well as clinical relevance supported by the existing literature. These variables were then entered into a multivariable model using the backward elimination method to identify the final set of covariates. We have clearly described the selection criteria and provided a complete list of variables included in the final model. The correlations between HAQ-DI with BASFI scores, DAPSA, PASDAS, DLQI, SF-36 physical component summary

score (PCS), and SF-36 mental component summary score (MCS) were analyzed using correlation analysis. Due to the majority of variables failing to adhere to a normal distribution, the Spearman's rank correlation analysis was conducted. All statistical tests were two-tailed, and p-values of less than 0.05 were considered statistically significant. Version 18.0 of the Statistical Package for the Social Sciences (SPSS) software package (IBM®, Armonk, NY, USA) was used for all statistical analyses.

RESULTS

Physical and Disease-related Characteristics

A total of 214 patients with PsA were included. The mean age (SD) was 52.2 years, and 144 (67.3%) patients were female. Of the patients, 37.3% were never smokers, and the mean body mass index (BMI) (SD) of the patients was 28.6 (5.2). The mean psoriasis disease duration (SD) was 16.1 (12.3) years, and PsA disease duration (SD) was 7.4 (6.9) years. Axial involvement was observed in 52% of patients, while polyarticular, oligoarticular, and monoarticular phenotypes were 48%, 20%, and 10%, respectively. Enthesitis was detected in 39% of the patients, while 41% and 26% of the patients exhibited nail involvement and dactylitis, respectively. The mean (SD) HAQ-DI was 0.32 (1.1).

Disability and Related Factors

Sixty-eight (31.8%) of patients [the mean age (SD) was 54.4 (11.7) years, and 77.9% of patients were female] had moderate-to-high disability. The baseline demographic and disease-related characteristics of the disabled and non-disabled patients were summarized in Table 1. Of the patients, 30% were never smokers, and the mean BMI (SD) of the patients was 29.7 (5.5). The mean psoriasis disease duration (SD) was 16.5 (13.1) years, and PsA disease duration (SD) was 7.6 (7.0) years. Axial involvement was observed in 84% of patients, while polyarticular, oligoarticular, and monoarticular phenotypes

Table 1. Demographic and clinical characteristics of patients with and without disability

	HAQ <1 (n=146)	HAQ >1 (n=68)	p
Age, mean (SD)	50.9 (11.9)	54.4 (11.7)	**0.020**
Gender, female, n (%)	91 (62.3)	53 (77.9)	**0.023**
PsA disease duration, mean (SD)	7.2 (6.9)	7.6 (7.0)	>0.05
Pso disease duration, mean (SD)	15.8 (11.8)	16.5 (13.1)	>0.05
Smoking history, yes, n (%)	86 (59.3)	47 (70.1)	>0.05
Education duration, mean (SD)	9.5 (4.1)	7.5 (3.8)	**0.001**
BMI >30, yes, n (%)	102 (69.9)	58 (85.3)	**0.016**
Peripheral arthritis, n (%)	114 (78.1)	57 (83.8)	>0.05
Enthesitis, n (%)	51 (34.9)	46 (67.6)	**<0.001**
Dactylitis, n (%)	40 (27.4)	20 (29.4)	>0.05
Axial involvement, n (%)	90 (61.6)	57 (83.8)	**0.001**
Nail involvement, n (%)	57 (39.6)	38 (55.9)	**0.026**
Methotrexate use, n (%)	89 (61.4)	41 (60.3)	>0.05
Biologic therapy use, n (%)	30 (20.5)	22 (32.4)	>0.05
DAPSA, mean (SD)	14.3 (12.3)	27.0 (17.9)	**<0.001**
PASDAS, mean (SD)	2.7 (1.2)	4.5 (0.9)	**<0.001**
TJC, mean (SD)	3.3 (6.6)	10 (12.8)	**<0.001**
SJC, mean (SD)	0.4 (1.2)	0.5 (1.2)	>0.05
LEI, mean (SD)	0.6 (1.3)	1.8 (2.1)	**<0.001**
BASFI, mean (SD)	1.2 (1.3)	4.8 (2.3)	**<0.001**
BSA, mean (SD)	1.1 (1.9)	1.3 (1.9)	>0.05
CRP, mg/dL, mean (SD)	6.3 (10.5)	8.2 (9.4)	**0.028**
DLQI, mean (SD)	1.6 (2.6)	3.5 (4.6)	**0.012**
SF-36 MCS, mean (SD)	63.3 (10.5)	57.5 (11.1)	**<0.001**
SF-36 PCS, mean (SD)	57.6 (12.3)	40.9 (9.1)	**<0.001**

PsA: Psoriatic arthritis, Pso: Psoriazis, BMI: Body mass index, DAPSA: Disease activity index for psoriatic arthritis, PASDAS: Psoriatic arthritis disease activity score, TJC: Tender joint count, SJC: Swollen joint count, LEI: Leeds enthesitis index, BASFI: Bath ankylosing spondylitis functional index, BSA: Body surface ares, CRP: C-reactive protein, DLQI: Dermatology life quality index, SF-36: Short form-36 health survey, MCS: Mental component summary score, PCS: Physical component summary score, SD: Standard deviation, HAQ: Health assessment questionnaire

were 68%, 28%, and 4%, respectively. Enthesitis was detected in 68% of the patients, while 56% and 29% of the patients exhibited nail involvement and dactylitis, respectively. Patients with disabilities were predominantly women, older, had higher BMI, and had lower education levels. Moreover, enthesitis, axial involvement, tender joints, nail involvement, serum CRP level, BASFI score, DLQI score, DAPSA score, and PASDAS were found to be associated with disability (Table 1). Disease activity (PASDAS and DAPSA), function (BASFI and SF-36 PCS), and quality of life (DLQI and SF-36 MCS) measurements were found to be correlated with HAQ-DI (Table 2). We established a multivariable model to assess the independent factors and covariates with disability and showed that TJC, [odds ratio (OR):1.07, 95% confidence interval (CI): 1.02-1.12; p=0.003], nail involvement (OR: 2.09, 95% CI: 1.05-4.13; p=0.035), and enthesitis (OR: 2.25, 95% CI: 1.13-4.48; p=0.021) were the main determinants of disability in patients with PsA (Table 3).

DISCUSSION

This study provides an informative overview of the burden of disability associated with PsA in patients, emphasizing both demographic and disease-related factors that contribute to impaired physical function. As assessed by the HAQ-DI, our results indicate that nearly one-third of patients with PsA experience moderate-to-high levels of disability. In accordance with previous research, our findings indicate that patients exhibiting elevated HAQ-DI scores were predominantly female, older, had higher BMI, and had lower levels of education. These demographic features have previously been recognized as independent risk factors for disability in multiple chronic rheumatologic conditions. A Turkish multicenter study found a substantial correlation between obesity and higher disease activity and poorer functional results in patients with PsA[16]. Likewise, advanced age and poorer educational levels have been linked to diminished self-efficacy, reduced health literacy, and restricted access to timely care, potentially exacerbating disability. Several clinical manifestations, such as enthesitis, axial involvement, tender joints, nail involvement, and elevated CRP levels, were substantially associated with worse physical function. Enthesitis and axial disease, in particular, are frequently more difficult to manage and are associated with a higher degree of disease severity. A recent study indicated that patients with axial disease and enthesitis exhibited higher disease activity and HAQ scores[17]. Although often disregarded, nail involvement may function as a visible indicator of a more extensive disease and has been associated with distal interphalangeal joint arthritis[18]. We found that functional status was more strongly correlated with current disease activity than disease duration. This aligns with previous research indicating that the influence of disease activity on functional scores diminishes with the progression of the disease duration. Moreover, there is a scarcity of substantial evidence indicating that the impact of clinical harm escalates as the illness progresses[19]. This result emphasizes the importance of early and aggressive intervention to control inflammation and prevent irreversible damage. Furthermore, the study demonstrated a close link between quality of life and functional capacity. Patients who reported higher HAQ-DI scores also reported a lower overall quality of life, which is consistent with previous research that has shown the extensive impact of PsA beyond joint-related symptoms. PsA has the potential to exacerbate the perceived disability and disease burden by disrupting sleep, mood, work productivity, and social participation[20,21]. These findings demonstrate the importance of a comprehensive and individualized treatment approach.

Table 2. Correlation of HAQ-DI and other patient reported outcomes of PsA patients

	r	p
DAPSA	0.53	**<0.001**
PASDAS	0.66	**<0.001**
BASFI	0.74	**<0.001**
DLQI	0.16	**0.02**
SF-36 MCS	-0.61	**<0.001**
SF-36 PCS	-0.29	<0.001

DAPSA: Disease activity index for psoriatic arthritis, PASDAS: Psoriatic arthritis disease activity score, BASFI: Bath ankylosing spondylitis functional index, DLQI: Dermatology life quality index, SF-36: Short form-36 health survey, MCS: Mental component summary score, PCS: Physical component summary score, HAQ-DI: Health assessment questionnaire-disability index, PsA: Psoriatic arthritis

Table 3. Multivariate analysis of disability

	CI (95%)	p
Age	1.03 (0.99-1.06)	0.13
Gender	0.73 (0.34-1.59)	0.43
Education duration	0.93 (0.85-1.02)	0.10
BMI >30	2.33 (1.06-5.41)	0.50
Enthesitis	2.25 (1.13-4.48)	**0.02**
Axial involvement	1.67 (0.84-3.31)	0.14
Nail involvement	2.09 (1.05-4.13)	**0.035**
TJC	1.07 (0.02-1.12)	**0.003**
CRP, mg/dL	1.01 (0.98-1.04)	0.37

BMI: Body mass index, TJC: Tender joint count, CRP: C-reactive protein, CI: Confidence interval

Study Limitations

Our study has some limitations. First, the single-center and cross-sectional design significantly limits the generalizability of the findings to broader populations. Additionally, due to the cross-sectional nature of the data, it is not possible to establish causal relationships between the variables studied. It is imperative to carefully consider these design limitations when interpreting the results, and future studies with multi-

center and longitudinal designs are required to confirm and expand upon these findings. Another important limitation of this study is the absence of a healthy control group or a disease control group. In the absence of comparison groups, it is challenging to ascertain if the observed connections are exclusive to patients with PsA. This limits the ability to draw disease-specific conclusions and may affect the interpretability and clinical relevance of the findings. Future research incorporating appropriate control groups is essential to clarify the specificity and significance of these associations. Lastly, the HAQ-DI is a well-known and generally accepted tool, but it might not measure all areas of disability that are important in PsA, such as fatigue, mental health, and work disability. The main strengths of the study were in its patient groups and sample size, as well as those treated with conventional and biologic DMARDs. Furthermore, we assessed the relationship between several outcome measures and the patient's disability. Conversely, there are also favorable features of the study. This study offers new perspectives on the functional impairment associated with PsA in a Turkish cohort, a population that has been underrepresented in the current literature. Although other countries have conducted similar studies, differences in culture, genetics, lifestyle, and healthcare access may impact disease expression and disability outcomes. Consequently, this investigation addresses a critical deficiency by conducting an assessment of not only clinical characteristics but also sociodemographic variables, including BMI and educational attainment, within a Turkish context.

CONCLUSION

In conclusion, our study highlights the importance of PsA on physical function and identifies critical demographic and clinical determinants of disability. Clinicians should be cognizant of early identification of high-risk patients and a multidisciplinary treatment strategy that encompasses both physical and psychosocial dimensions of the condition. Future research should prioritize longitudinal evaluations of impairment and the creation of comprehensive patient-reported outcome measures.

Ethics

Ethics Committee Approval: This study was approved by the Ethics Committee of İzmir Katip Çelebi University (decision no: 0411, date:11.09.2023). The research was performed in compliance with the principles of the Declaration of Helsinki.

Informed Consent: This study the single-center and cross-sectional design.

Footnotes

Authorship Contributions

Concept: E.D.E., Design: E.D.E., Data Collection or Processing: S.G., K.Y., E.Ç., H.K., E.E., Analysis or Interpretation: S.A., D.S., Literature Search: A.Ö., K.G., Writing: E.D.E.

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

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