Original Article

Demographic characteristics, clinical features, and quality of life in patients with psoriatic arthritis

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ABSTRACT

The current research progress on (psoriatic arthritis) PsA pathogenesis has clarified the crucial role of early diagnosis and treatment in disease development and quality of life (QoL). Demographic information, clinical and paraclinical information, and PsA severity were documented. The patients were followed up for one year. The data were collected using the Health Assessment Questionnaire (HAQ), developed under the auspices of the Stanford Arthritis, Rheumatism, and Aging Medical Information System, and The Disease Activity Score-28 (DAS-28) was calculated. Data were analyzed by SPSS25 statistical software and the Spearman correlation coefficient test. Fifty patients (62% women) with a mean PsA duration of 11.7 years were enrolled. The most frequent type of PsA was symmetric polyarthritis (48%), followed by asymmetric oligoarticular (30%). The mean uveitis, dactylitis, enthesis, Nail involvement, and swollen/tender joint counts were 24%, 22%, 28%, 56%, and 78%, respectively. Nearly half of patients (56%) had metabolic syndrome. 30(60%) patients were treated with methotrexate.

There was a high correlation between Skin disease severity and swollen/tender joint counts. There were no significant differences between smoking or alcohol consumption with Disease Activity in Psoriatic Arthritis. In addition, there was no significant statistical difference between Disease Activity in Psoriatic Arthritis and a positive family history of psoriasis in our patients. This study is designed to evaluate Psoriatic arthritis types and determine comorbidities patterns, treatment regimes, and disease characteristics in PsA patients treated at Imam Khomeini Hospital.

Keywords: Psoriatic arthritis, DAS28 scores, HAQ, CRP

Introduction

Psoriatic arthritis (PsA) is a musculoskeletal and inflammatory disease associated with psoriasis. Men and women between the ages of 40 and 50 are almost equally affected by PsA [1, 2]. PsA has diverse clinical manifestations and may exhibit different patterns in one patient. It damages systems such as peripheral and axial joints, skin, and nails [3, 4]. Sometimes, joint involvement precedes skin lesions, and almost one-third of patients have a positive family history. Nail involvement is usually accompanied by skin involvement but can also occur alone [4, 5].

PsA can also be associated with comorbidities, such as osteoporosis, uveitis, inflammatory bowel disease, and cardiovascular diseases [1]. Despite the variable clinical course, many patients with PsA may experience progressive destructive joint disease, impaired physical function, and reduced quality of life (QoL) [1, 6].

It is estimated that approximately 30% of psoriasis patients also develop PsA, of which 15% remain undiagnosed [7]. On the other hand, PsA is a severe form of arthritis that leads to joint deformity and damage in a large number of patients. Bone erosions occur in 47% of patients within the first two years of disease onset [8]. Enthesitis has been reported to occur in 30-50% of patients. Pain can sometimes be observed around the patella, iliac crest, and epicondyles [9].

Acute or chronic dactylitis has been reported in 40-50% of patients. Digit involvement most frequently occurs in the area between the third and fourth toes. Dactylitis is often associated with severe disease [4, 10]. Anterior and posterior uveitis occurs in 8% of patients with PsA [11]. PsA is diagnosed based on clinical

evidence and imaging. Currently, there is no specific diagnostic biomarker in medical centers [12]. However, since PsA is an inflammatory disease, the serum levels of C-reactive protein (CRP) and Erythrocyte Sedimentation Rate (ESR) as serum biomarkers in the diagnosis and prognosis of the disease may change [13].

Although it is challenging to diagnose PsA due to the high number of organs involved, the diagnosis process has been facilitated by doctors by using classification criteria such as CASPAR (classification criteria for PsA) and several other screening tools [2, 6]. The criteria mentioned above are scored based on the following observations:

1) evidence of current psoriasis, 2) psoriatic nail dystrophy, 3) negative results of the test for rheumatoid factor, 4) dactylitis, and 5) radiographic evidence of juxta-articular new bone formation.

Together, these involvements significantly impact patients' physical function and QoL. The prognosis of the time to treatment initiation is crucial because it can reduce the side effects of the disease in the long run. PsA treatment should be initiated to alleviate signs and symptoms, prevent structural damage, and maximize QoL. Using invalid tools may give incorrect interpretations of disease severity and, consequently, lead to under-/over-treatment, with all its clinical and economic consequences [2, 14, 15].

PsA is accurately controlled according to the quantification of disease activity/severity by composite indices such as Disease Activity Score (DAS28, where the number 28 refers to the 28 evaluated joints), which exclusively evaluates joint involvement. DAS28 values are determined based on the number of tender or swollen joints, patient health index, and CRP (mg/l) or ESR (mm/hr) values [16, 17].

Physical impairments in PsA patients are usually assessed using the Health Assessment Questionnaire-Disability Index (HAQ-DI). In the HAQ, 20 questions are asked in 8 domains: dressing and grooming, getting up (arising), eating/drinking, walking, hygiene, reaching (reach), gripping (grip), and activities.

Patients express their ability to perform tasks in these fields from "no problem" to "unable to do," the overall score of which is in the range of 0-35. Thus, patients can be classified into three groups: mild disability (0-1), moderate disability (> 2-1), and severe disability (more than 2-3) [17-19].

Medications for PsA

Various targeted therapies have been introduced to manage the symptoms of PsA [15, 20]. When examining the symptoms, the main affected cases (e.g., peripheral joints, axial disease, dactylitis, enthesitis, psoriasis, and nail disease) should also be considered when choosing the appropriate medication [15, 20, 21]. These detailed clinical and laboratory assessments mainly aim to achieve minimum disease severity, improve patients' functional status and QoL, and minimize side effects (since the onset of treatment) [19, 22, 23].

Conventional disease-modifying antirheumatic drugs (DMARDs), such as sulfasalazine (SSZ), cyclosporine, leflunomide, and methotrexate, are utilized to relieve symptoms [21, 24-26]. Several studies have demonstrated that tumor necrosis factor inhibitors (TNFis) (especially etanercept and infliximab) and methotrexate have positive effects on joints and skin, reduce inflammation, slow radiographic progression, and improve QoL, though some side-effects have been reported [15, 21, 24, 26-28].

To evaluate the long-term effects of medication and its side effects as well as changes in QoL and disease severity, this study systematically monitored the demographic, clinical, and laboratory characteristics of PsA patients referred to Imam Khomeini Hospital for one year in two visits to the hospital.

Materials and Methods

The current study was a descriptive-analytical cross-sectional study. The statistical population consisted of all patients with PsA (n=50) referred to the Department of Rheumatology and Dermatology, Imam Khomeini Hospital Complex, Tehran, from the end of March 2021 to the end of April 2022. Specific inclusion and exclusion criteria were considered.

Inclusion criteria

1) Definitive diagnosis of PsA based on CASPAR criteria
2) Patients' written informed consent to participate in the study

Exclusion criteria

1) The patient's dissatisfaction with continuing to participate in the plan
2) Failure to visit the hospital for the second time

On the first visit, the patients were first examined by a rheumatologist, and their demographic data, clinical outcomes, laboratory tests, HAQ, and initial disease severity were completed based on the DAS28 formula and calculation. The HAQ score was calculated as mild disability (0-1), moderate disability (>2-1), or severe disability (>2-3).

Patients' Disease Activity Score (DAS28) was calculated as follows:

DAS28-CRP= 0.56*sqrt(TJC28) + 0.28*sqrt(SJC28) + 0.36*ln(CRP+1) + 0.014*GH + 0.96

Reference: http://www.das-score.nl

[t28 = tender joint count of 28 joints, GH = general health measured by Patient's Global Assessment of Disease Activity on a VAS of 100 mm, CRP = C-reactive protein]

(values <2.6: remission, 2.6<x<3.3: low disease activity (LDA), 3.2<x<5.1: moderate disease activity (MDA), and >5.1: high disease activity (HDA) [16, 29]).

Then, the rheumatologist prescribed SSZ, non-steroidal anti-inflammatory drugs (NSAIDs), methotrexate (MTX), CinnoRA, and Altebrel based on the clinical symptoms and patients' previous medications. The second visit was done approximately 6 months to 1 year after the first visit, where CRP, DAS28, and HAQ values were recalculated.

Data were analyzed using SPSS at two levels: descriptive and inferential. Then, the normal distribution of quantitative data was checked using Kolmogorov-Smirnov and Z tests. Parametric

or non-parametric tests were employed according to the variables. Also, Spearman's and Pearson's correlation tests and the Chi-Square test were used to investigate the relationship between quantitative and qualitative variables, respectively. Paired *t*-tests or Wilcoxon signed-rank tests were utilized to test if there was any difference in responses after the intervention. P-values <0.05 were considered statistically significant.

Conclusion

Most frequent type of PsA was symmetric polyarthritis (48%), followed by asymmetric oligoarticular (30%). The mean uveitis, dactylitis, enthesis, Nail involvement, and swollen/tender joint counts were 24%, 22%, 28%, 56%, and 78%, respectively. Nearly half of patients (56%) had metabolic syndrome. 30(60%) patients were treated with methotrexate.Sulfasalazine and NSAIDs were used in 10% and 16% of patients, respectively. 4% were on Altebrel therapy, and 38% used CinnoRA with or without conventional synthetic DMARD combinations. Serum CRP values, DAS28 scores, and HAQ were decreased after specific treatment. There was a high correlation between Skin disease severity and swollen/tender joint counts. There were no significant differences between smoking or alcohol consumption with Disease Activity in Psoriatic Arthritis

Results and Discussion

1. Demographic data

Overall, 50 patients (38% male and 62% female) were examined during a one-year period **(Table 1)**. The patients' average age, height, weight, and BMI were 42.08±1.51 y, 166.40±1.12 cm, 74.68±1.983 kg, and 26.9±0.549, respectively.

Among the patients, 2 (4%) were Gilak, 20 (40%) were Turk, 13 (26%) were Fars, 4 (8%) were Lur, 5 were Kurd (10%), 1 (2%) were Baloch, 2 (4%) were Mazani, and 3 (6%) were from other ethnicities. Also, 27 patients (54%) had a family history of the disease in first-degree relatives.

2. Clinical and laboratory data

Among the patients, 9 (18%) had abnormal levels of liver enzymes, and 22 (44%) had abnormal lipid profiles. Our collected data showed that 28 patients (56%, 17 females and 11 males) had metabolic syndrome. **Table 2** lists the average laboratory data. Also, 24 (48%) had symmetric polyarthritis (SP), the highest joint involvement among the patients. The lowest involvement was related to spondyloarthropathy (22%). A total of 39 patients (78%) had swollen or tender joints, and 11 patients (22%) did not have swollen or tender joints **(Table 3)**. Clinical examinations revealed that 21 patients (42%) had morning stiffness, with a mean duration of 10.9±2.12 minutes. Also, the mean duration of skin disease and arthritis was calculated to be 11.770±1.60 and 5.95±0.83 years, respectively.

3. Prescription drugs

Among the 50 patients examined, 30 patients (60%) were treated with MTX (alone or in combination with other drugs), of which 12 patients (24%) only took MTX. Also, 2 patients (4%) took Altebrel subcutaneously (Altebrel + MTX/Altebrel + NSAID), 19 patients (38%) took CinnoRA alone or with other drugs, of which 7 patients (14%) took CinnoRA + MTX. Besides, 9 patients (18%) did not take any of MTX, Altebrel, or CinnoRA. Also, 5 patients (10%) took oral SSZ **(Table 4)**.

4. Patient status criteria

4.1. Examining CRP, DAS28, and HAQ values in patients' two hospital visits

DAS28 and HAQ values were evaluated in two hospital visits by questionnaire and formula, respectively. The CRP value was also tested at two visits. DAS28-1-DAS28-2 and HAQ-1-HAQ-2 scores (second visit compared to first visit) showed a significant reduction for P-values <0.001, with a highly significant difference before and after the visit. Also, the CRP test showed a significant decrease in the second visit compared to the first visit (for P-values <0.001).

4.2. Correlation between skin disease severity and the number of tender joints

According to our investigation, Spearman's correlation coefficient between skin disease severity and the number of tender joints was 0.762, which was significantly significant (P<0.001).

4.3. Correlation between morning stiffness and DAS28 and HAQ in the first visit

Spearman's correlation coefficients showed that none of DAS28 and HAQ were related and had no correlation with morning stiffness.

4.4. Difference in the degree to which DAS28 decreased in patients with three drug groups

For this purpose, patients were divided into three groups:

1) Those who had not taken any of MTX, Altebrel, and CinnoRA;

2) Those who had only taken MTX; and

3) Those who had taken at least one of Altebrel and CinnoRA together with other drugs.

According to **Figure 1**, the second and third groups showed a decreased DAS28 value compared to the first group (while the second group showed more decreased DAS28 in the second visit compared to the first visit compared to the other two groups, these differences were not statistically significant).

4.5. Relationship between disease activity and smoking

Among the patients examined, 14 (28%) were smoking. Spearman's correlation coefficient was calculated to be rs = -0.06552, p (2-tailed) = 0.65125, which was not statistically significant.

4.6. Relationship between disease activity and alcohol consumption (drinking)

Also, 5 patients (10%) consumed alcohol. Spearman's correlation coefficient was calculated to be rs = 0.04436, p (2-tailed) = 0.7597, which was not statistically significant.

4.7. Relationship between disease activity and family history of psoriasis

Among them, 27 patients (54%) had a positive family history of psoriasis. Spearman's correlation coefficient was calculated to be rs = -0.06886, p (2-tailed) = 0.63468, which was not statistically significant.

4.8. Relationship between disease activity and metabolic syndrome

Among them, 28 patients (56%, 17 females and 11 males) had metabolic syndrome. Spearman's correlation coefficient was calculated to be rs = 0.18766, p (2-tailed) = 0.19189, which was not statistically significant.

PsA is a very heterogeneous disease with a wide variety of extra-articular manifestations, which can be associated with multiple comorbidities, resulting in reduced functional quality, QoL, and chronic systemic inflammation [30].

Studies indicate that 20-30% of psoriasis patients also develop PsA. In a prospective study on 464 patients with psoriasis, 51 were diagnosed with PsA during an 8-year follow-up. The annual incidence rate of PsA was estimated to be about 2.7% [6].

In a recent study, clinical disease progression was more specific in previous referring patients. Those with more than two years of disease duration at the time of referral had longer PsA and psoriasis duration and more joint damage and used fewer DMARDs [28].

In Geijer et al.'s (XXX) study, 72 patients (29 men (35%) and 43 women (38%)) with PsA who met PsA classification criteria (CASPAR) were enrolled in the study. The average age of the patients was 47.8 years (21-80 years). Among them, 63% of women and 46% of men smoked. Most of them had polyarthritis. In addition, 63% of women and 55% of men developed oligoarticular/polyarticular disease. 61% of women and 86% of men had skin psoriasis. The average CRP value was 26.3 in women and 12.5 in men. Similarly, the mean DAS28 was 3.8 in women and 3.7 in men, which decreased to 3.1 and 2.6, respectively, after five years of follow-up [31].

A systematic review in 2022 found that 8 of 22 studies reported low levels of CRP. In these 22 studies, the CRP expression levels were highly variable (0.1-238 mg/L). However, high CRP levels may be an individual predictor for disease progression and response to treatment [13].

Our study demonstrated that the patients in the second group (those who only took MTX) showed a greater decrease in the DAS28 variable in the second visit than in the first visit compared to the other two groups, though these differences were not statistically significant. On the other hand, our data showed that treatment with MTX, CinnoRA, and Altebrel could probably be somewhat effective in reducing disease severity, which could be proven by enrolling more subjects in the study. Since PsA is a heterogeneous inflammatory arthritis, patients are not only affected by skin and joint diseases but may also suffer from axial disease, enthesitis, dactylitis, nail disease, and metabolic syndrome. Together, these factors have a harmful effect on physical function and QoL. Therefore, a patient's prognosis with early PsA is considered an essential part of the treatment initiation decision-making process. Examining adverse prognostic indicators, including high inflammatory markers at the time of visit, the number of damaged joints, previously taken drugs, and joint damage can help the prognosis of the disease and the type of treatment and proper monitoring of patients. This information can also be applied in the PsA registry system program.

Table 1. Patients' demographic information

Variable	Group	Frequency (%)
Sex	Male	19 (38%)
	Female	31 (62%)
Marital status	Single	10 (20%)
	Married	40 (80%)
Smoking		14 (28%)
Drinking (alcohol consumption)		5 (10%)
Family history of disease in first-degree relatives		27 (54%)
Patient's past medical history	Diabetes	9 (18%)
	Hypertension	14 (28%)

Table 2. Patients' mean laboratory data

Variable	Mean
Hb	13.644±0.197
Cholesterol	159.44±7.137
TG	142.96±9.904
AST	26.76±1.658
ALT	29.82±2.184
ESR	23.58±1.914

Table 3. Patients' clinical manifestations

Variable	Frequency	Variable	Frequency
Dactylitis	11 (22%)	Symmetric polyarthritis (SP)	24 (48%)
درد باتک	18 (36%)	Asymmetrical oligoarthritis	15 (30%)
Backache	18 (36%)	Spondyloarthropathy	11 (22%)
Enthesitis	14 (28%)	Mild skin disease	28 (56%)
Nail involvement	28 (56%)	Moderate skin disease	20 (40%)
Uveitis	12 (24%)	Severe skin disease	2 (4%)

Table 4. Frequency of taking prescription drugs based on clinical symptoms

Drug	Frequency
SSZ	5 (10%)
NSAID	8 (16%)
MTX	30 (60%)
CinnoRA	19 (38%)
Altebrel	2 (4%)

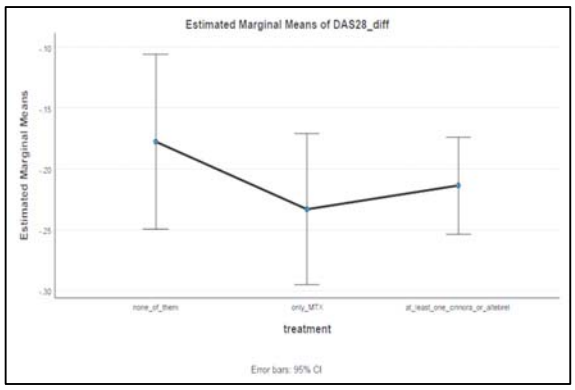

Figure 1. Difference in the degree that DAS28 decreased in patients with three drug groups

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