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Research Article

Clinical Characteristics and Management Patterns of Psoriatic Arthritis Patients in Abu Dhabi: 10-Year Analysis

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Abstract

Aim: This retrospective study aims to analyze ten years of data on Psoriatic arthritis (PsA) patients treated at a single center in Abu Dhabi.

Methodology:A retrospective study was conducted at a single center in Abu Dhabi, analyzing ten years of data on PsA patients. Demographic information, immunological assessments, medication history, and comorbidities were evaluated. Statistical analyses were performed using descriptive statistics and non-parametric methods.

Results: The study included 49 PsA patients, predominantly Emirati (63.26%). Immunologic assessments demonstrated a significant decrease in Disease Activity in Psoriatic Arthritis score over time ($p < 0.0001$), along with improvements in inflammatory markers. Methotrexate was the most used medication (73.46%). Comorbidities such as hypertension (40.82%) and Type 2 diabetes mellitus (30.61%) were prevalent, while serious cardiovascular events and malignancy were rare.

Conclusion: The study findings align with international guidelines, emphasizing the need for comprehensive management addressing various clinical domains. Despite limitations such as the retrospective design and small sample size, the study contributes to understanding PsA epidemiology and treatment patterns in the Middle East region.

Keywords: Chronic Inflammatory Disorder; Disease-Modifying Antirheumatic Drugs; Psoriatic Arthritis, Biologic Agent

Abbreviations

ANA	:	Antinuclear antibodies
CBC	:	Complete blood count
CRP	:	C-Reactive Protein
DAPSA	:	Disease Activity Index for Psoriatic Arthritis
DMARD drug	:	Disease-modifying anti-rheumatic
ESR	:	Erythrocyte Sedimentation Rate
HLA-B27	:	Human Leukocyte Antigen B27
IL-17	:	Interleukin-17

IL-23	:	Interleukin-23
MDA	:	Minimal Disease Activity
MTX	:	Methotrexate
NSAIDs	:	Nonsteroidal Anti-Inflammatory Drugs
PSA	:	Psoriatic Arthritis
RF	:	Rheumatoid factor
TNFi	:	Tumor Necrosis Factor inhibitors
TNF-α	:	Tumor Necrosis Factor-alpha

Introduction

Psoriatic arthritis is a chronic inflammatory arthritis that shares some characteristics with psoriasis as well as other forms of inflammatory arthritis but has its unique characteristics. Several organs are affected, including joints, eyes, the gut, and cardiovascular systems [1]. The global incidence and prevalence rate of PSAvaries significantly, with annual incidence ranging from 0.1 to 23.1 cases per 100,000[2,3], and prevalence rates varying from 0.001 to 0.42% [3,4], with the Middle East and North Africa having a 0.01% prevalence[2]. The prevalence of psoriatic arthritis in patients with psoriasis increases with time, reaching 1.7% at five years, 3.1% at ten years, 5.1% at 20 years, and 20.5% at 30 years[5,6].

Affected individuals may experience severe disability and a reduced quality of life due to the disease. Even though PSA's pathogenesis is not fully understood, it is believed to be caused by genetic, immunological, and environmental factors[7]. PSA involves both innate and adaptive immune responses, leading to increased production of pro-inflammatory cytokines such as TNF-alpha, interleukin-17, and interleukin-23 (IL-23)[8]. These cytokines play a crucial role in the inflammatory processes observed in PSA and serve as targets for therapeutic interventions. PSA is associated with cardiovascular diseases and related comorbidities such as obesity, hypertension, insulin resistance, type II diabetes, and hyperlipidemia. Several studies have shown an increased prevalence of cardiovascular risk factors in PSA patients. Vascular comorbidities include ischemic heart disease, hypertension, dyslipidemia, atherosclerosis, peripheral vascular disease, and cerebrovascular disease. The pathophysiological link appears to be a shared inflammatory pathway between metabolic syndrome and PSA[9,10].

Various measures of disease activity have been proposed as treatment targets for PSA, one of those measures is the Disease Activity in Psoriatic Arthritis (DAPSA), and Minimal Disease Activity (MDA) [11]. Recently, international experts recommended DAPSA as the primary treatment target[12]. The DAPSA score is derived from the tender joint count in 68 joints and the swollen joint count in 66 joint scores, the patient's global and pain scores on a Visual Analog Scale, and the C-Reactive Proteinlevel (CRP) [13]. A DAPSA score of ≤14 indicates a state of low disease activity, and a score of ≤4 signifies remission [14].

Due to the heterogeneous presentation of PSA, the type of treatment initiated depends on the domains involved, including peripheral arthritis, enthesitis, dactylitis, axial disease, skin/nail disease, and should be guided by disease severity, degree of joint damage, the extent of extra-articular disease, patient preference, and other comorbidities.

Treatment strategies typically include a combination of pharmacological and non-pharmacological therapies, including physical therapy, occupation therapy, exercise programs, and smoking cessation, which should be strongly encouraged and incorporated into the treatment plan[15]: nonsteroidal anti-inflammatory drugs (NSAIDs)[16], Disease-Modifying Antirheumatic Drugs (DMARDs), and biologic agents[17]. DMARDs, such as Methotrexate (MTX), and biologic agents, including Tumor Necrosis Factor inhibitors (TNFi) and interleukin inhibitors, have shown efficacy in reducing disease activity and inhibiting joint damage[18,19].

In recent years, researchers have been focusing on understanding the clinical profile and management outcomes of patients with PSA in various populations. However, there is a lack of sufficient data regarding the characteristics and treatment patterns of PSA patients in the Middle East region, specifically in Abu Dhabi, United Arab Emirates. By comprehending the unique demographic and clinical features of PSA patients in this region, healthcare professionals can tailor treatment approaches and optimize patient care.

This manuscript analyzes ten years of data from PSA patients treated at a center in Abu Dhabi. The focus is on demographics, immunological assessments, medication history, and comorbidities. By evaluating this data, the aim is to provide valuable insights into the clinical characteristics and management patterns of PSA patients in this local population.

Methodology

A retrospective study was carried out at a single center in Abu Dhabi to analyze ten years of PSA data. The research followed ethical guidelines and was approved by the Research Ethics Committee.

Inclusion criteria include patients who attended a Rheumatology clinic from 2010 until 2021, and those patients who were more than 16 years old and have met the Classification of Psoriatic Arthritis (CASPAR criteria). Initially, the total number of patients was 557. Out of this, only 49 have fulfilled the inclusion criteria of PSA.

To provide a comprehensive understanding of the study group, demographic information was collected from each subject. Age, measured in years, was analyzed to determine the age distribution within the study group using statistical measures such as mean and standard deviation. Gender was categorized as male or female, and the percentage of individuals in each gender group was calculated. Nationality was also documented, with a particular emphasis on differentiating between Emiratis and non-Emiratis (Nationalities represented include Bangladeshi, Canadian, Comoran, Dutch, Egyptian, Filipino, Pakistani, Russian, Sierra Leonean, Sudanese, Syrian, and Yemeni).

Immunologic assessments were conducted to determine disease activity in individuals with Psoriatic Arthritis. The DAPSA score was used to quantify the level of disease activity at the time of diagnosis, and DAPSA scores were also obtained later to assess disease progression in the last visit documented in our center. In addition, inflammatory markers such as Erythrocyte Sedimentation Rate (ESR) and CRP levels were measured, and immunologic markers like Rheumatoid Factor (RF) and Antinuclear Antibody (ANA) were recorded to determine the prevalence of positive results and exclude the diagnosis. The study also looked at Complete Blood Count (CBC) values and the presence of HLA-B27.

The research also compiled a detailed medication history of each patient, including the use of conventional Disease-Modifying Antirheumatic Drugs (cDMARDs) like Methotrexate, Sulfasalazine, and Leflunomide, as well as biological Disease-Modifying Antirheumatic Drugs (bDMARDs) agents such as Adalimumab, Infliximab, Etanercept, Certolizumab, Golimumab, Secukinumab, Ustekinumab, and Ixekizumabin in addition to Apremilast. This helped to gain insights into treatment patterns within the study group.

Furthermore, the study assessed comorbidities and complications, documenting the presence of conditions such as hypertension, Type 2 diabetes mellitus, and Metabolic Syndrome, and calculating their respective prevalence rates within the study population. The research also delved into serious cardiovascular events, including myocardial infarction and stroke, as well as malignancy, to understand their occurrence within the study population. This provided a comprehensive overview of the health profile of individuals with Psoriatic Arthritis.

Statistical Analysis

Descriptive statistics were performed to summarize the collected data. Continuous variables, such as age, DAPSA scores, ESR, and CRP, were presented as mean, standard deviation, minimum, and maximum values. Categorical variables, including gender, nationality, medication history, and comorbidities, were reported as counts and percentages. All analyses were conducted using non-parametric analysis in Statview™ software.

Results

Demographic

The study involved participants with an average age of around 47.86 years and a standard deviation of approximately 13.78. This indicates that there was some variation in the ages of the participants, with the youngest being 19 years old and the oldest being 80. The sample consisted of 19 males (38.77%) and 30 females (61.22%). In terms of nationality, 63.26% of the participants were Emirati and the remaining 36.73% were non-Emirati. These statistics provide valuable insights into the demographic characteristics of the participants, giving us a better understanding of their age, gender, and nationality distribution, Table 1.

PARAMETER	Count(N=49)
Age (Years)	
N	49
Mean	47.86
Standard deviation	13.78
Minimum	19.00
Maximum	80.00
Gender	
Male	19 (38.77 %)
Female	30 (61.22 %)
Nationality	
Bangladeshi	1 (2.04 %)
Canadian	1 (2.04 %)
Comoran	1 (2.04 %)
Dutch	1 (2.04 %)
Egyptian	2 (4.08 %)
Emirati	31 (63.26 %)
Filipino	3 (6.12 %)
Pakistani	1 (2.04 %)
Russian	1 (2.04 %)
Sierra Leonean	1 (2.04 %)
Sudanese	1 (2.04 %)
Syrian	1 (2.04 %)
Yemeni	4 (8.16 %)

Table 1: Summary Statistics of Demographics of All Subjects.

Immunologic Assessments

Our study analyzed the immunologic assessments of 49 patients diagnosed with PSA. At the time of diagnosis, DAPSA showed a mean score of 31.22 ($p < 0.0001$). At the current assessment, the

mean DAPSA score significantly decreased to 10.14 ($p < 0.0001$), indicating a substantial reduction in disease activity over time. The mean change from baseline DAPSA was calculated at -21.08, representing a remarkable -67.52% decrease in disease activity. Regarding inflammatory markers, the mean ESR was 38.18 ($p < 0.05$). CRP levels showed a mean of 23.55 ($p < 0.05$), indicating significant inflammation. Among the patients tested for RF, 95.23% tested negative, while 4.76% tested positive ($p < 0.05$), suggesting a low prevalence of RF positivity in this population. ANA testing revealed that 92.85% of patients were negative, while 7.14% were positive ($p < 0.05$), indicating a subset of patients with potential autoimmune involvement. HLA-B27 testing showed that 81.08% of patients were negative, with 18.91% testing positive ($p < 0.05$). CBC testing was performed on all the patients, Table 2.

PARAMETER	Count(N= 49)
DAPSA at Diagnosis	
N	49
Mean	31.22
Standard deviation	21.45
Minimum	11.50
Maximum	88.80
Current DAPSA	
N	49
Mean	10.14
Standard deviation	9.84
Minimum	0.10
Maximum	46.00
Mean Change from Baseline	-21.08 (-67.52 %)
Intragroup p-value	<0.0001
ESR	
N	49
Mean	38.18
Standard deviation	27.46
Minimum	2.00
Maximum	119.00
CRP	
N	49
Mean	23.55
Standard deviation	44.12
Minimum	0.10
Maximum	242.00
RF	
N	42
0 (negative)	40 (95.23 %)
1 (positive)	2 (4.76 %)
Data Not Available	7
ANA	
N	42
0 (negative)	39 (92.85 %)
1 (positive)	3 (7.14 %)
Data Not Available	7
CBC	
N	49
Tests performed	49 (100.00 %)
HLA-B27	
N	37
0 (negative)	30 (81.08 %)
1 (positive)	7 (18.91 %)
Data Not Available	12

Table 2: Summary Statistics of Immunologic Assessments.

Medication History

The study found that Methotrexate was the most used by 73.46% of the patients, whereas Sulfasalazine, was used by 14.29% of the patients. Leflunomidewas used by 8.16%. The study also observed varying usage proportions for Adalimumab, Infliximab, Etanercept, Certolizumab, Golimumab, Secukinumab, Ustekinumab, Ixekizumab, and Apremilast., with some being more commonly used than others, Table 3.

PARAMETER	Count(N= 49)
Methotrexate	
N	49
0*	13 (26.53 %)
1**	36 (73.46 %)
Sulfasalazine	
N	49
0	42 (85.71 %)
1	7 (14.29 %)
Leflunomide	
N	49
0	45 (91.84%)
1	4 (8.16%)

PARAMETER	Count(N= 49)
Adalimumab	
N	49
0	31 (63.26%)
1	18 (36.73 %)
Infliximab	
N	49
0	37 (75.51 %)
1	12 (24.49 %)
Etanercept	
N	49
0	39 (79.59%)
1	10 (20.41 %)
Certolizumab	
N	49
0	47 (95.92 %)
1	2 (4.08 %)
Golimumab	
N	49
0	46 (93.88 %)
1	3 (6.12 %)
Secukinumab	
N	49
0	38 (77.55 %)
1	11 (22.45 %)
Ustekinumab	
N	49
0	47 (95.92 %)
1	2 (4.08 %)
Ixekizumab	
N	49
0	47 (95.92 %)
1	2 (4.08 %)
Apremilast	
N	49
0	48 (97.96 %)
1	1 (2.04 %)
0*= did not use the medications, and 1**= used it.	

Table 3: Summary Statistics of Medication History.

Comorbidities and Complications

Approximately 40.82% of patients had hypertension, 30.61% had Type 2 diabetes mellitus, and 18.37% had Metabolic Syndrome. Serious cardiovascular events such as myocardial infarction and stroke were relatively rare, affecting 4.08% and 2.04% of patients, respectively. Similarly, malignancy was a rare occurrence, affecting only 2.12% of patients. These statistics provide an overview of the prevalence of these health conditions within the study group, shedding light on the subjects' overall health and potential factors influencing their conditions, Table 4.

PARAMETER	Count(N= 49)
Hypertension	
N	49
0 *	29 (59.18 %)
1 **	20 (40.82 %)
Type 2 diabetes mellitus	
N	49
0	34 (69.39 %)
1	15 (30.61 %)
Metabolic Syndrome	
N	49
0	40 (81.63 %)
1	9 (18.37 %)
Myocardial infarction	
N	49
0	47 (95.92 %)
1	2 (4.08 %)
Stroke	
N	49
0	48 (97.96 %)
1	1 (2.04 %)
Malignancy	
N	49
0	48 (97.95 %)
1	1 (2.12 %)
0*=Does not have the co-morbidity, 1**= has the co-morbidity.	

Table 4: Summary Statistics of Comorbidities and Complications.

Discussion

PSA is a multifaceted systemic disorder with a wide range of clinical manifestations and comorbidities. This study provides valuable insights into the demographics, immunologic assessments,

medication history, and comorbidities of PSA patients in Abu Dhabi over 10 years. Our study sample has an average age of 47.86 years, with a gender distribution of 19 males and 30 females, and 63.26% of the subjects being Emirati.

Demographically, our study revealed that the mean age of PSA patients in Abu Dhabi was 47.86 years, which is consistent with previous studies reporting a peak onset of PSA in the fifth and sixth decades of life[20,21]. The predominance of female patients (61.22%) in our cohort aligns with the notion that PSA has a higher prevalence in women[22,23]. However, another epidemiological study by Gladmann et al and Kammer et al showed equal sex incidence[24,25].

In our study, comprehensive immunologic assessments revealed significant improvements in disease activity over time, as evidenced by a remarkable reduction in DAPSA scores from a mean of 31.22 at diagnosis to 10.14 currently ($p < 0.0001$) which was consistent with a previous open-label, prospective study of patients satisfying the Classification criteria for Psoriatic Arthritis study (CASPAR) criteria for PSA[26]. In this study evaluating methotrexate (MTX) in patients with PSA, the research demonstrated significant improvements across various clinical domains, including arthritis, skin, dactylitis, enthesitis, and functional disability. The study utilized a starting dose of MTX at 15 mg/week, with subsequent dose escalation every 4-12 weeks, revealing no notable adverse effects. The study also showed that patients, more than half of whom had Moderate to High Disease Activity (58%), achieved, and sustained a major response using cDAPSA, with only 11% showing no response. Additionally, a significant proportion of patients achieved a favorable European League Against Rheumatism (EULAR) DAS28 response, with 74% experiencing a moderate response and 6.8% achieving a good response[26].

Guidelines play a pivotal role in shaping the management of PSA, and two prominent sets, namely the EULAR and the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA), are particularly influential. While EULAR focuses on musculoskeletal aspects and may not cover psoriatic skin disease comprehensively, GRAPPA is known for its comprehensive approach, encompassing key PSA domains such as arthritis, spondylitis, enthesitis, dactylitis, skin disease, and nail disease[27].

The GRAPPA guidelines emphasize achieving the lowest possible level of disease activity across all domains of PSA, optimizing functional status, improving quality of life, and preventing structural damage. These guidelines are frequently implemented in the African and Middle Eastern regions, offering both standard and expedited therapeutic recommendations for each clinical domain. The choice between the 'standard' and 'expedited' arms depends on factors such as resource availability, allowing flexibility in treatment approaches [27]. The flexibility in medication choices observed in our study aligns with the tailored treatment approaches recommended by GRAPPA guidelines, including both the 'standard' and 'expedited' arms as outlined in their recommendations.

Given the challenges in applying standard treatment guidelines in resource-poor countries, the International League of Associations for Rheumatology (ILAR) has recently tailored the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) and European League Against Rheumatism (EULAR) guidelines for countries in Central/South America and Africa. Primarily based on GRAPPA with some EULAR recommendations, these adapted guidelines incorporate insights from local experts. While not universally applicable across Africa and the Middle East, they represent a crucial step towards establishing regional guidelines. The observed lack of consistency in PSA management guidelines suggests varying practices within individual countries and among physicians within the same hospitals [27].

We found that 73.46% of the patients were using Methotrexate, while 14.29% were taking Sulfasalazine, and 8.16% were on Leflunomide. Additionally, a notable portion of the subjects (comprising Adalimumab, Infliximab, Etanercept, Certolizumab, Golimumab, Secukinumab, Ustekinumab, Ixekizumab, and Apremilast) were using biologic agents. This finding aligns with the Japanese Society for Psoriasis Research (JSPR), which reported that 52.7% of current therapeutic regimens include biologics, DMARDs, NSAIDs, and other medications, with Adalimumab being the most commonly prescribed biologic[28] It's worth noting that a 2017 survey observed a decrease in the use of Tumor Necrosis Factor (TNF) inhibitors from 74% to 65%, with NSAIDs, DMARDs, biologics, and other treatments being utilized in the management of 55.8% of PSA patients[29].

Our study revealed that among the subjects surveyed, 40.82% had hypertension, 30.61% were diagnosed with Type 2 diabetes, and 18.37% had Metabolic Syndrome. Notably, instances of serious cardiovascular events and malignancy were relatively rare among the patients, suggesting an overall prevalence of health-related issues. According to Ogdie et al around 40% of patients with PSA have three or more comorbidities, including cardiovascular disease, metabolic syndrome, obesity, diabetes, fatty liver disease, depression, and anxiety which was by our study[30]. A survey conducted among 463 patients with PSA identified hypertension (21.2%) as the most frequently reported, followed by hyperlipidemia, obesity, diabetes, and hyperuricemia/gout. Additionally, the survey highlighted other common comorbidities, including inflammatory bowel disease, cardiovascular disease, cerebrovascular disease, and thyroid disease[31].

Furthermore, a population-based retrospective cohort study demonstrated a Psoriatic Arthritis prevalence of 3.6% among psoriatic patients, with 284 patients displaying arthritis symptoms out of a total of 7932 psoriatic patients. This study also revealed a significantly higher prevalence of metabolic disorders in patients with PSA compared to those without[32]. Multidimensional analysis indicated a significantly increased risk of newly developed cerebrovascular disease in individuals with PSA compared to those without arthritis [33].

Over a decade, between 2003 and 2013, the prevalence of Psoriatic Arthritis among psoriatic patients increased from 6.3% to 12.7%. In this same timeframe, patients with joint involvement were more likely to exhibit metabolic disorders, including hypertension, diabetes, and dyslipidemia, in comparison to those without arthritis. Additionally, psoriatic patients with arthritis faced a higher likelihood of developing severe vascular complications, specifically cardiovascular diseases, when compared to those without arthritis [34].

In a recent systematic review and meta-regression analysis focused on the Middle East and North Africa, the reported prevalence of Psoriatic Arthritis (PSA) was 0.01%, based on a single study from Kuwait[2]. A study in the United Arab Emirates estimated a prevalence of 0.3% among 3985 patients attending primary healthcare clinics [35]. Notably, a clinical follow-up study in Saudi Arabia reported an annual incidence rate of PSA at 4.3% over 2 years[36].

Limitations

This study has several limitations. First, it is a retrospective analysis based on data from a single center, which may limit the generalizability of the findings to other populations. Second, the sample size was relatively small, which could affect the statistical power and precision of the results. Third, the study relied on the accuracy and completeness of the recorded data, which may be subject to inherent limitations in electronic medical records.

Conclusion

Our study provides insights into the demographic characteristics, immunologic assessments, medication history, and comorbidities of PSA patients over 10 years. The findings indicate that PSA predominantly affects individuals in their late forties, with a higher prevalence among females. Immunologic assessments revealed significant variability in the DAPSA Score at diagnosis, showing a notable decrease with treatment over time. Most patients received treatment with DMARDs and biologic agents. Common comorbidities observed in the study included hypertension, Type 2 diabetes, and Metabolic Syndrome.

Our study highlights the importance of tailored approaches due to variations in healthcare services and complexities within countries. It highlights the need for increased awareness and research in the Middle East, emphasizing local adaptations of international guidelines.

Author Contributions

Guarantors of the article:

Development of study concept and design:

Study supervision:

Acquisition, analysis, and interpretation of the data:

Statistical analysis:

Drafting of the manuscript:

Critical revision of the manuscript for important intellectual content:

All authors approved the final version of the manuscript including the authorship.

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References

1. Yamamoto T, Kawada A (2018) Clinical characteristics of Japanese patients with psoriatic arthritis: comparison with East Asian countries. The Journal of Dermatology45: 273-8.
2. Stolwijk C, vOM, Boonen A, van Tubergen A (2016) Global prevalence of spondyloarthritis: a systematic review and meta□regression analysis. Arthritis care & research. Arthritis care & research68: 1320-31.
3. Alamanos Y, Voulgari PV, Drosos AA (2008) Incidence and prevalence of psoriatic arthritis: a systematic review. The Journal of Rheumatology35:1354-8.
4. Gelfand JM, Gladman DD, Mease PJ, Smith N, Margolis DJ, et al. (2005) Epidemiology of psoriatic arthritis in the population of the United States. Journal of the American Academy of Dermatology53: 573-e1.
5. Wilson FC, Icen M, Crowson CS, McEvoy MT, Gabriel SE, et al. (2009) Incidence and clinical predictors of psoriatic arthritis in patients with psoriasis: a population-based study. Arthritis Rheum 15: 233-9.
6. Christophers E, Barker JNWN, Griffiths CEM, Daudén E, Milligan G, et al. (2010) The risk of psoriatic arthritis remains constant following initial diagnosis of psoriasis among patients seen in European dermatology clinics. J EurAcadDermatolVenereol24: 548-54.
7. Mease PJ, Armstrong AW (2014) Managing patients with psoriatic disease: the diagnosis and pharmacologic treatment of psoriatic arthritis in patients with psoriasis. Drugs74: 423-41.
8. Gossec L, Baraliakos X, Kerschbaumer A, de Wit M, McInnes I, et al. (2020) EULAR recommendations for the management of psoriatic arthritis with pharmacological therapies: 2019 update. Ann Rheum Dis 79: 700-12.

9. Han C, Robinson Jr DW, Hackett MV, Paramore LC, Fraeman KH, et al. (2006) Cardiovascular disease and risk factors in patients with rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis. J Rheumatol33: 2167-72.

10. Tam LS, Tomlinson B, Chu TTW, Li M, Leung YY, et al. (2008) Cardiovascular risk profile of patients with psoriatic arthritis compared to controls – The role of inflammation. Rheumatology 47: 718-23.

11. Helliwell PS, FitzGerald O, Fransen J, Gladman DD, Kreuger GG, et al. (2013) The development of candidate composite disease activity and responder indices for psoriatic arthritis (GRACE project). Ann Rheum Dis72: 986-91.

12. Smolen JS, Schöls M, Braun J, Dougados M, FitzGerald O, et al. (2018) Treating axial spondyloarthritis and peripheral spondyloarthritis, especially psoriatic arthritis, to target: 2017 update of recommendations by an international task force. Annals of the Rheumatic Diseases 77: 3-17.

13. Schoels M, Aletaha D, Funovits J, Kavanaugh A, Baker D, et al. (2010) Application of the DAREA/DAPSA score for assessment of disease activity in psoriatic arthritis. Ann Rheum Dis 69: 1441-7.

14. Schoels MM,Aletaha D, Alasti F, Smolen JS(2016) Disease activity in psoriatic arthritis (PsA): defining remission and treatment success using the DAPSA score. Ann Rheum Dis 75: 811-8.

15. Di Minno MN PR, Iervolino S, Russolillo A, Lupoli R,Scarpa R, CaRRDs Study Group, et al. (2014) Weight loss and achievement of minimal disease activity in patients with psoriatic arthritis starting treatment with tumour necrosis factor α blockers. Ann Rheum Dis73: 1157-62.

16. Cuéllar ML, Citera G, Espinoza LR (1994) Treatment of psoriatic arthritis. Baillieres Clin Rheumatol8: 483-98.

17. Lie E, van der Heijde D, Uhlig T, Heiberg MS, Koldingsnes W, et al. (2010) Effectiveness and retention rates of methotrexate in psoriatic arthritis in comparison with methotrexate-treated patients with rheumatoid arthritis. Ann Rheum Dis69: 671-6.

18. Coates LC, Kavanaugh A, Mease PJ, Soriano ER, Acosta-Felquer ML, et al. (2016) Group for Research and Assessment of Psoriasis and Psoriatic Arthritis 2015 Treatment Recommendations for Psoriatic Arthritis. Arthritis Rheumatol68: 1060-71.

19. Ritchlin CT, KA, Merola JF, et al. (2019) Achieving Minimal Disease Activity in Psoriatic Arthritis: Predictors of Treatment Response in the PALACE 1 Trial. J Rheumatol 46: 1603-10.

20. Gladman DD, Antoni C, Mease P, Clegg DO, Nash P (2005) Psoriatic arthritis: epidemiology, clinical features, course, and outcome. Ann Rheum Dis64:ii14-ii7.

21. Ritchlin CT, Colbert RA, Gladman DD(2017) Psoriatic arthritis. N Engl J Med376: 957-70.

22. Tillett W d-VC, McHugh NJ. (2012) Psoriatic arthritis and gender: a review of the literature. Rheumatology (Oxford) 51: 558-66.

23. Pranesh Nigam AK, Srivastac, Uxa AK, Muhija RD, Jain RX (1998) Psoriatic arthritis: A clinico- radiological study. J Indian RheumatAssoc6:89.

24. Gladman DD, Shuckett R, Russell ML, Thorne JC, Schachter RK (1987) Psoriatic arthritis (PsA)-an analysis of 220 patients. Q J Med238:127-41.

25. Kammer GM,SoterNA, Gibson DJ, Schur PH (1979) Psoriatic arthritis: A clinical, immunologic and HLA study of 100 patients. Semin Arthritis Rheum9:75-97.

26. Appani SK, Devarasetti PK, Irlapati RVP, Rajasekhar L(2019) Methotrexate achieves major cDAPSA response, and improvement in dactylitis and functional status in psoriatic arthritis. Rheumatology58: 869-73.

27. Bedaiwi M, Al-Homood IA, El-Garf A, Uthman I, Sunna N, et al.. (2019) Disease burden and treatment challenges of psoriatic arthritis in Africa and the Middle East. J Rheumatology International39: 1321-9.

28. Gladman DD (2009) Psoriatic arthritis. DermatolTher 22: 40-55.

29. Yamamoto T, Ohtsuki M, Sano S, Igarashi A, Morita A, et al. (2017) Prevalence and current therapies of psoriatic arthritis in Japan: a survey by the Japanese Society of Psoriasis Research in 2016. J Dermatol 44: e121.

30. Ogdie A, Schwartzman S, Husni ME (2015) Recognizing and managing comorbidities in psoriatic arthritis. CurrOpinRheumatol 27: 118-26.

31. Chin YY, Yu HS, Li WC, Ko YC, Chen GS, et al. (2013) Arthritis as an important determinant for psoriatic patients to develop severe vascular events in Taiwan: a nation-wide study. J EurAcadDermatolVenereol 27:1262-8.

32. Becciolini A, Parisi S, Del Medico P, Farina A, Visalli E, et al. (2023) Predictors of DAPSA Response in Psoriatic Arthritis Patients Treated with Apremilast in a Retrospective Observational Multi-Centric Study. Biomedicines11: 433.

33. Wang TS, Hsieh CF, Tsai TF (2016) Epidemiology of psoriatic disease and current treatment patterns from 2003 to 2013: a nationwide, population-based observational study in Taiwan. J DermatolSci84: 340-5.

34. Wei JCC, Sung-Ching HW, Hsu YW, Wen YF, Wang WC, et al. (2015) Interaction between HLAB60 and HLA-B27 as a better predictor of ankylosing spondylitis in a Taiwanese population. PLoSONE10: e0137189.

35. Al Saleh J, El Sayed M, Monsef N, Darwish E (2016) The prevalence and the determinants of musculoskeletal diseases in Emiratis attending primary health care clinics in Dubai. Oman Med J 31: 117–23.

36. Elnady B, El Shaarawy NK, Dawoud NM, Elkhouly T, El-Sayed Desouky D, et al. (2019) Subclinical synovitis and enthesitis in psoriasis patients and controls by ultrasonography in Saudi Arabia; incidence of psoriatic arthritis during two years. Clin Rheumatol 38: 1627-1635.