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ORIGINAL RESEARCH

Rheumatology and Dermatology Multidisciplinary Clinic Improves Diagnostic Precision and Treatment Decisions in Patients Suspected or Diagnosed with Psoriatic Arthritis

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Purpose: Psoriatic arthritis (PsA) and psoriasis (Pso) are highly heterogeneous inflammatory diseases. Multidisciplinary approaches are associated with improved results in both musculoskeletal (MSK) and skin manifestations. We describe the experience and main diagnostic and therapeutic outcomes of one of the largest and longest-running Rheumatology/Dermatology multidisciplinary PsA Clinic.

Methods: Single center, cross-sectional study of all patients observed at the PsA Clinic of Hospital de Santa Maria, Portugal, between November 2010 and February 2021. The total number of visits/ patients, demographics, referral indications, and definite skin and MSK diagnosis were registered. In patients with PsA confirmed diagnosis, PsA and Pso characteristics, previous treatments and their modifications were captured using Reuma.pt.

Results: Eight hundred and two visits were performed, corresponding to 505 patients, 51.3% female, with a mean age of 51.0 ± 13.8 years. The main indication for referral was diagnosis uncertainty (56.4%), and a definitive PsA diagnosis was established in 28.9% of these cases. For patients in whom PsA was not identified, the main alternative diagnoses were osteoarthritis [peripheral (n = 70) or axial (n = 29)], fibromyalgia (n = 22), axial spondylarthritis without Pso (n = 21), tendinitis/enthesitis (n = 20), and carpal tunnel syndrome (n = 19). The main alternative dermatological diagnoses were seborrheic dermatitis (n = 15), nail dystrophy not due to Pso (n = 15), onychomycosis (n = 14) and eczema (n = 9). In patients with confirmed PsA (n = 308), 54.5% had already been treated with disease-modifying antirheumatic drugs (DMARD), and 15.9% had received at least one biologic DMARD. Treatment was modified in 78.9% of PsA patients, 58.0% due to uncontrolled skin activity, 34.5% MSK activity, and 7.7% both. Most of the treatment changes occurred due to lack of efficacy (56.4%).

Conclusion: This study shows the impact, through diagnostic precision (by increasing the number of psoriatic and non-psoriatic definite diagnoses), and treatment modifications, for skin and MSK manifestations, from over 10 years of the implementation of a multidisciplinary PsA Clinic.

Keywords: psoriatic arthritis, psoriasis, multidisciplinary clinic, rheumatology, dermatology

Introduction

Psoriatic arthritis (PsA) and psoriasis (Pso) are chronic inflammatory diseases characterized by highly heterogeneous musculoskeletal (MSK) and skin phenotypes, respectively.[1,2] Since 40% of Pso patients will develop PsA over a period of approximately

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10 years, and up to 84% of patients with PsA are first diagnosed with Pso, these two diseases are intertwined, and when addressing one of them, health professionals must be attentive to the symptoms of the other.[3–6] Their clinical diversity is superimposed by several skin and MSK mimics, and an unpredictable disease course, that makes early and definite diagnosis sometimes difficult to establish. This is a pertinent issue, as delayed diagnosis of PsA is known to be associated with worse radiographic and functional outcomes, whereas an early diagnosis is strongly associated with better functional capacity.[2] Furthermore, Pso and, in particular, PsA do not have defined screening procedures nor well-characterized disease markers, making it sometimes difficult to be diagnosed by less trained physicians.[2]

The treatment for Pso and PsA is also usually performed separately by dermatologists and rheumatologists, respectively, which can lead to the overlook and undertreatment of the symptoms of the disease that are not in the scope of their own specialty.[1]

For these reasons, and the recognition of PsA as a severe and debilitating disease, the European League Against Rheumatism (EULAR) and the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) recommend a multidisciplinary approach for PsA (and PsO) management.[7,8] Data presented by multidisciplinary care units show that a multidisciplinary approach, encompassing both dermatology and rheumatology specialties, has favourable results in both skin and MSK improvement, as well as patient' and physicians' satisfaction levels.[9,10]

Given the above, the objective of this study was to describe the cumulative experience and main outcomes of the Rheumatology/Dermatology multidisciplinary PsA Clinic established at Hospital de Santa Maria (HSM), Portugal, for more than 10 years. For the scientific community, the acknowledgement of the benefits of a joint clinic can motivate clinicians and different stakeholders such as administrations boards to support these clinics and inspire more hospitals to start a similar multidisciplinary model.

Methods

This was a single center, cross-sectional study of all patients observed at the Rheumatology/Dermatology PsA Clinic of HSM (Lisboa, Portugal), between November 2010 and February 2021. This clinic is run once a month, on average with 12 patients being observed by a rheumatologist and a dermatologist. Rheumatology and Dermatology consultations take place in different, but close, offices, with simultaneously 1 dermatologist and 1–2 rheumatologists observing patients separately, followed by a joint observation/discussion of the patient, as previously described.[11]

Patients can be referred by Rheumatology or Dermatology, but also by other specialties. The main indications for referral are 1) diagnostic uncertainty of cutaneous and/or musculoskeletal manifestations suspected of Pso and PsA, respectively, 2) uncontrolled disease activity for therapeutic decisions, 3) new skin or MSK manifestations in previously diagnosed and treated PsA or Pso patients for differential diagnosis.

The PsA Clinic's goals are in accordance with those described in the literature, improving the specialties' collaboration and patients' care.[2,10,11] One of its main goals is 1) to facilitate an early and accurate diagnosis for both skin and MSK manifestations in patients suspected of Pso and PsA, respectively. When necessary, skin biopsies and nail mycological culture exams were performed to help in the skin manifestations differential diagnosis, as well as laboratory and imaging exams for MSK manifestations. Regarding monitoring, 2) a systematic use and record of disease activity indexes for both Pso and PsA was recommended. In relation to treatment, 3) the aim was to facilitate therapeutic decisions, the achievement of remission of all manifestations, to reduce overall drug toxicity, and to favor the use of therapies effective in multiple disease's domains.

The total number of visits and patients, demographics for the whole population (gender and age), indication for referral, definite skin, and MSK diagnosis, including confirmation and exclusion of Pso and PsA, were registered. In those patients with a PsA confirmed diagnosis, PsA and Pso disease characteristics (age of onset and diagnosis, disease subtypes), comorbidities (arterial hypertension, dyslipidaemia, diabetes *mellitus*, cardiovascular disease, obesity, smoking status), laboratory tests [rheumatoid factor, anti-CCP (cyclic citrullinated peptide) antibodies, human leukocyte antigen (HLA)- B*27], disease activity indices for both PsA and Pso, and previous treatments and their modifications in the first visit to this Clinic, were captured using Reuma.pt (the Rheumatic Diseases Portuguese Registry).[12] The presence of PsA extra-articular manifestations, throughout the course of the disease until the first visit, was also recorded: Pso (skin and nail involvement), enthesitis, uveitis, and inflammatory bowel disease were those included in the final analysis.

PsA activity was evaluated using joint counts (tender joints out of 68; swollen joints out of 66); Patient's Global Assessment of Disease Activity (PtGA) Visual Analogue Scale (VAS) 0–100; C-reactive protein (CRP); erythrocyte sedimentation rate (ESR); Disease Activity Score in 28 joints (DAS28); Disease Activity Index for Psoriatic Arthritis (DAPSA); and enthesis assessment with MASES (Maastricht Ankylosing Spondylitis Enthesis Score) and SPARCC Enthesitis Index (Spondyloarthritis Research Consortium of Canada). Pso disease activity was specifically assessed using PASI (Psoriasis Area and Severity Index), NAPSI (Nail Psoriasis Severity Index), and DLQI (Dermatology Life Quality Index).

This study was performed in accordance with the principles stated in the Declaration of Helsinki. As previously specified, data was obtained from Reuma.pt, a national database approved by the Portuguese National Commission for Data Protection and the Centro Académico de Medicina de Lisboa Ethics Committee. Registered patients are required to sign an informed consent.

Statistical analysis was performed with the IBM SPSS Statistics 26.0. Continuous data were expressed as mean ± standard deviation (SD), and the categorical variables were expressed as percentage.

Results

During a period of approximately 10 years, a total of 802 multidisciplinary visits were performed, corresponding to 505 patients with an average of 1.6 ± 1.2 visits per patient (63.0% of the total were first visits). 51.3% were female, with a mean age of 51.0 ± 13.8 years old (ranging from 17 to 95 years). Table 1 summarizes characteristics of the study population, including variables analysed in the patients with a confirmed PsA diagnosis.

The main indication for referral for the PsA Clinic (Figure 1) was uncertainty of diagnosis (285 patients, 56.4% of the total). Of these, the majority (153 patients, 53.7%) were referred for a rheumatological definitive diagnosis, 90 (31.6%) patients for a dermatological definitive diagnosis, and 42 (14.7%) were referred due to both skin and MSK diagnosis

Table 1 Study Population Demographics and PsA Patients' Disease Characteristics

Demographic Characterization	Total	N
Female, n (%)	259 (51.3)	505
Age at first visit (years), mean (SD)	51.0 (13.8)	505
In patients with confirmed PsA		308
Female, n (%)	135 (43.8)	308
Age at onset, mean (SD)	39.0 (13.9)	256
Age at diagnosis, mean (SD)	43.5 (13.9)	238
Rheumatoid factor positivity, n (%)	15 (6.8)	219
Anti-CCP positivity, n (%)	12 (5.5)	216
HLA-B*27 positivity, n (%)	29 (11.7)	248
Comorbidities at the 1st appointment		
Arterial hypertension, n (%)	107 (34.7)	308
Dyslipidaemia, n (%)	92 (29.9)	308
Diabetes *Mellitus*, n (%)	29 (9.4)	308
Cardiovascular disease, n (%)	4 (1.3)	308
Obesity, n (%)	39 (32.2)	121
BMI (kg/m2), mean (SD)	29.3 (9.4)	121

(*Continued*)

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Table 1 (Continued).

Demographic Characterization	Total	N
Smoking status		160
Current smoker, n (%)	38 (23.8)	160
Former smoker, n (%)	32 (20.0)	160
Non-smoker, n (%)	90 (56.2)	160
Disease activity measures at the 1st appointment		
Tender joint count, mean (SD)	3.3 (5.4)	258
Swollen joint count, mean (SD)	1.6 (2.9)	254
PtGA (VAS 0–100), mean (SD)	42.2 (26.0)	97
CRP (mg/L), mean (SD)	8.6 (13.8)	260
ESR (mm/hour), mean (SD)	24.7 (21.6)	255
DAS28, mean (SD)	3.4 (1.5)	73
DAS28-CRP, mean (SD)	2.9 (1.3)	73
DAS28-3v, mean (SD)	3.0 (1.3)	213
DAPSA, mean (SD)	14.6 (11.2)	60
Presence of enthesitis, n (%)	30 (12.8)	235
MASES, mean (SD)	0.1 (0.6)	235
SPARCC Enthesitis Index, mean (SD)	0.3 (1.0)	235
PASI, mean (SD)	5.3 (5.0)	234
NAPSI, mean (SD)	1.7 (2.4)	155
DLQI, mean (SD)	4.3 (5.0)	82

Abbreviations: N, Number; SD, Standard Deviation; PsA, Psoriatic Arthritis; Anti-CCP, Anti-Cyclic Citrullinated Peptide Antibodies; HLA, Human Leukocyte Antigen; BMI, Body Mass Index; PtGA, Patient's Global Assessment of Disease Activity; VAS, Visual Analogue Scale; CRP, C-reactive protein; ESR, Erythrocyte Sedimentation Rate; DAS28, Disease Activity Score in 28 joints; DAPSA, Disease Activity Index for Psoriatic Arthritis; MASES, Maastricht Ankylosing Spondylitis Enthesis Score; SPARCC, Spondyloarthritis Research Consortium of Canada; PASI, Psoriasis Area and Severity Index; NAPSI, Nail Psoriasis Severity Index; DLQI, Dermatology Life Quality Index.

uncertainty. The remaining patients (220) were referred due to disease activity – 94 (42.7%) patients due to uncontrolled Pso; 37 (16.8%) due to uncontrolled PsA MSK manifestations; 89 (40.5%) due to both Pso and PsA MSK activity.

In Table 2 we present the changes in diagnosis at the first Rheumatology/Dermatology PsA Clinic visit, subdivided according to the indication for referral.

A "de novo" diagnosis of PsA was established in 80 out of the 277 patients referred with a diagnosis suspicion (28.9%).

For those with MSK manifestations, in whom a PsA diagnosis was not established, the main alternative diagnoses (Figure 2) were osteoarthritis (OA) [peripheral (n = 70) or axial (n = 29)], fibromyalgia (n = 22), axial spondylarthritis (SpA) without Pso (n = 21), tendinitis/enthesitis (n=20), and carpal tunnel syndrome (n = 19).

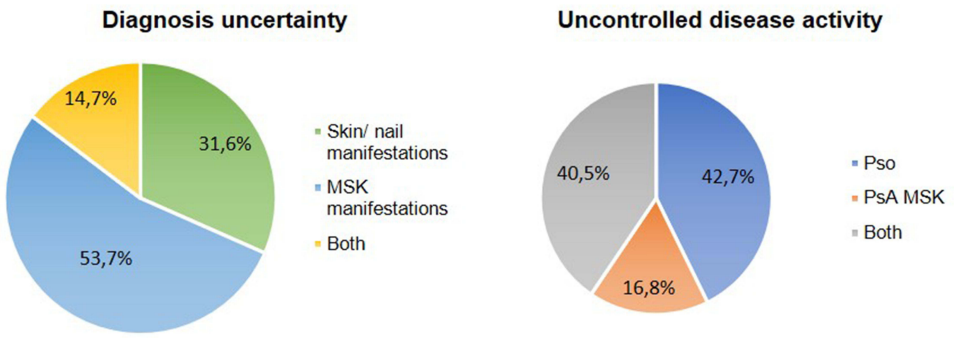

Figure 1 Indication for referral to the PsA Rheumatology/Dermatology Clinic.
Abbreviations: MSK, musculoskeletal; Pso, Psoriasis; PsA, Psoriatic arthritis.

Within the group of patients referred due to suspected Pso, the main alternative dermatological diagnoses (Figure 3) were seborrheic dermatitis (n = 15), nail dystrophy not Pso (n = 15), onychomycosis (n=14), and eczema (n = 9). There were 2 cases of Pso induced by treatment with tumour necrosis factor (TNF) inhibitors in patients without PsA.

There were also patients who had already a PsA diagnosis but required observation due to new manifestations (n = 8). From the 7 referred for dermatological observation, only 3 were confirmed as Pso, while the other ones had a concomitant disease such as mycosis or eczema. The only patient who was sent for a rheumatology opinion had an enchondroma and a possible Paget's disease of bone.

In the study population with a confirmed PsA diagnosis (n = 308), 274 (89.0%) fulfil CASPAR Criteria (Classification Criteria for Psoriatic Arthritis). The interval between the PsA diagnosis and the first PsA Rheumatology/Dermatology visit was on average 7.5 years. The most prevalent PsA subtype according to Moll&Wright (Figure 4) was symmetric polyarthritis (n = 140), followed by oligoarthritis (n = 71), predominant spondylitis (n = 41), and distal interphalangeal (DIP) predominant subtype (n = 20). There were three cases of arthritis mutilans.

Regarding comorbidities, out of the patients with confirmed PsA diagnosis, 145 (47.1%) had at least one, the most common being arterial hypertension (34.7% of the patients) and dyslipidaemia (29.9%). The average BMI was 29.3 ± 9.4, and 23.8% were active smokers.

The average DAS28, DAPSA, PASI, and NAPSI scores were 3.4 ± 1.5, 14.6 ± 11.2, 5.3 ± 5.0, and 1.7 ± 2.4, respectively (Table 1).

Table 2 Changes in Diagnosis Established at the First PsA Clinic Visit

Indication for referral	Previous diagnosis	Patients observed (N=505)	Patients with confirmed PsA diagnosis (N= 308)
Diagnosis uncertainty	Suspected PsA in patients with Pso, n (%)	181 (35.8)	62 (20.1)
	Suspected Pso in patients with MSK symptoms, n (%)	96 (19.0)	18 (5.8)
Disease activity	PsA with active Pso, n (%)	105 (20.8)	105 (34.1)
	PsA with active MSK symptoms, n (%)	30 (5.9)	30 (9.7)
	PsA with both Pso and MSK activity, n (%)	57 (11.3)	57 (18.5)
	PsA in remission, n (%)	28 (5.5)	28 (9.1)
New manifestations	New skin manifestations in patients with PsA, n (%)	7 (1.4)	7 (2.3)
	New MSK manifestations in patients with PsA, n (%)	1 (0.2)	1 (0.3)

Abbreviations: N, Number; PsA, Psoriatic arthritis; Pso, Psoriasis; MSK, musculoskeletal.

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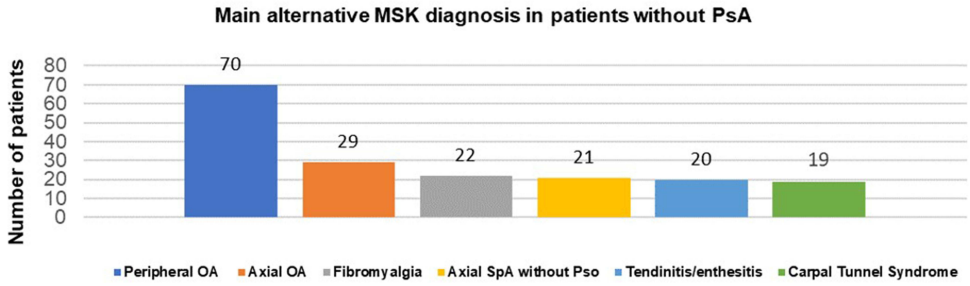

Figure 2 Distribution of the main rheumatological alternative diagnoses for patients without PsA.
Abbreviations: MSK, musculoskeletal; OA, Osteoarthritis; SpA, Spondyloarthritis.

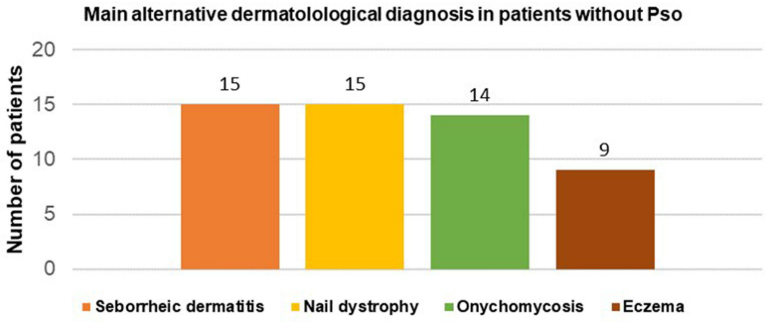

Figure 3 Distribution of the main dermatological alternative diagnoses in patients without Pso.

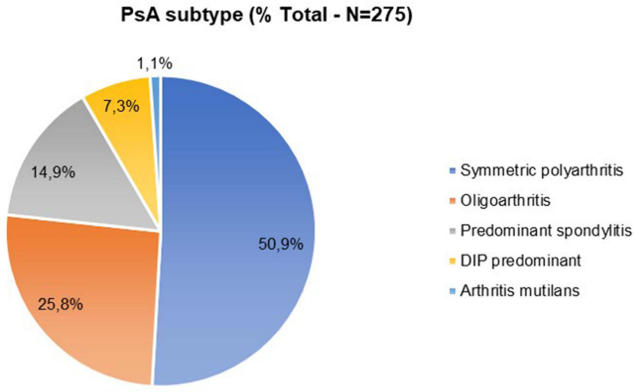

Figure 4 Distribution of PsA subtype in the patients with confirmed diagnosis.
Abbreviations: N, Number; PsA, Psoriatic arthritis; DIP, Distal interphalangeal.

Considering extra-articular manifestations, 288 (93.5%) of the PsA patients had a history of (or current) cutaneous Pso, 119 (38.6%) of nail involvement, 85 (27.6%) of enthesitis, 12 (3.9%) of anterior uveitis, and 2 (0.6%) of ulcerative colitis. The main subtype of Pso (present in a total of 302 patients) was plaque Pso (n = 270, 89.4%), followed by exclusive nail involvement (n = 14, 4.6%), inverse (n = 12, 4.0%) and palmoplantar Pso (n = 4, 1.3%). One patient had erythrodermic Pso and one guttate Pso.

Prior to the first appointment, 54.5% (n = 168) had already been treated with disease-modifying antirheumatic drugs (DMARD), mainly methotrexate, and 15.9% (n = 49) had received treatment with at least one biological (b) DMARD – the most common first bDMARDs used were etanercept (n = 24, 49.0%), infliximab (n = 11, 22.4%), and adalimumab (n = 8, 16.3%).

The treatment decisions made in the patients with confirmed PsA after the visit to the clinic are summarized in Table 3 (maximum of 3 per patient). There was a change in treatment in 78.9% of the patients with PsA, the most frequent being the introduction of topical therapy for psoriasis in 55.2% of the patients, followed by dosage change of any ongoing treatment (in 21.8% of the patients) and introduction of NSAID (Non-Steroidal Anti-inflammatory Drug) in 12.3% of the patients. A csDMARD was started/added in 31 patients (10.1% of the patients), whereas bDMARD was

Table 3 Summary of the Treatment Decisions at the First PsA Clinic Visit

Treatment Decisions	Total
Change in treatment, n (%)	**N= 425**
No change	65 (15.3)
Introduction of topical therapy (Pso)	170 (40.0)
Introduction of NSAID (MSK)	38 (8.9)
Introduction of steroids (MSK)	9 (2.1)
Introduction of csDMARD (Pso and/or MSK)	29 (6.8)
Introduction of bDMARD (Pso)	1 (0.2)
Switch of csDMARD (Pso and MSK)	1 (0.2)
Switch of bDMARD (Pso and/or MSK)	8 (1.9)
Introduction of additional csDMARD (Pso and/or MSK)	2 (0.5)
Change dosage of ongoing therapy (Pso and/or MSK)	67 (15.8)
Change frequency of ongoing therapy (Pso and/or MSK)	14 (3.3)
Change route of ongoing therapy (Pso and/or MSK)	6 (1.4)
Treatment discontinued (Pso and/or MSK)	5 (1.2)
Proposed change in therapy (Pso and/or MSK)	10 (2.4)
Manifestation that motivated the change in treatment, n (%)	**N= 349**
Psoriasis	202 (58.0)
PsA	120 (34.5)
Both	27 (7.7)
Reason for treatment change, n (%)	**N= 349**
No prior treatment	105 (30.1)
Treatment ineffectiveness	197 (56.4)
Adverse effect	17 (4.9)
Remission	27 (7.7)
Patient refusal	3 (0.9)

Abbreviations: N, Number; PsA, Psoriatic arthritis; Pso, Psoriasis; MSK, Musculoskeletal; NSAID, Non-Steroidal Anti-inflammatory Drug; csDMARD, Conventional Synthetic Disease-modifying Antirheumatic Drug; bDMARD, Biologic Disease-modifying Antirheumatic Drug.

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initiated in 1 patient and switched in 8 (2.6%). Treatment was modified due to uncontrolled skin activity (58.0%), MSK activity (34.5%), or both (7.7%). Most of the changes occurred due to treatment's lack of efficacy (56.4%), but 30.1% were because there was no treatment prescribed for one of the active manifestations.

Discussion

In this report, we describe our experience and the main diagnosis and therapeutic outcomes of a Rheumatology/Dermatology multidisciplinary PsA Clinic in a Portuguese tertiary University Hospital. The overall number of visits (average of 80/year) and proportion of first visits (63%), in the 10 years analyzed, was similar to those reported in identical models of PsA rheumatology and dermatology clinics.[13] This predominance of first visits is based on a joint decision-making functional model for more complex cases, difficult to diagnose or treat, and where long-term regular follow-up of all patients with PsA is not intended. Therefore, the majority of patients were discharged after one visit, returning to their reference specialist for standard follow-up, with new referral in the future if necessary.

A definitive PsA diagnosis was established in 308 (61.0%) of the observed patients, in which 80 (15.8% of the total number of patients) were a "de novo" diagnosis. In previous reports, we can identify highly variable % of established PsA diagnosis (45–85%) and "de novo" PsA diagnosis (24–62%) on the observed populations, which is dependent on the defined criteria for patients' referral and models from each PsA clinic/center.[13,14] It is worth noticing that, unlike other similar studies, which only allowed in the clinic patients with confirmed Pso and suspected MSK symptoms of PsA, we also included patients with skin or nail lesions suspected of Pso.[14,15]

In relation to the symptoms that prompted the referral, 1/3 were evaluated exclusively due to dermatological manifestations and 1/3 due to MSK symptoms. This is quite different from another multidisciplinary unit, where the majority of patients (77%) were referred because of cutaneous symptoms.[1] This reflects the bidisciplinary referral model that we adopted, allowing referrals for either a rheumatological or dermatological observation, namely from less experienced physicians in this field.

Similar to other studies, the main alternative MSK diagnoses in patients with Pso were non-inflammatory diseases, the most frequent osteoarthritis and fibromyalgia.[9,13–15] The main alternative dermatological diagnoses were seborrheic dermatitis, nail dystrophy not due to Pso (including onychomycosis) and eczema. This has not, in fact, been alluded to in the previous reports of these types of multidisciplinary clinics.

After the first visit, there was a change in treatment in 78.9% of the patients with PsA, a higher number than in other studies (47% to 63.6%), most likely due to the fact that every change was considered, including dosage change.[13,16] In 31 patients with PsA (10.1%), a csDMARD was added, which is inferior to other reports (30%),[13] while in 9 patients (2.9%) a bDMARD was started or switched, also lower than the experience from other centres (28.6%), although the overall number of observed patients was much inferior compared to our study.[16]

Most of the treatment changes were due to psoriasis activity (58.0%), and the large majority of those were the introduction of topical therapy since most patients fail to use it regularly and rheumatologists, in general, can have limited knowledge of the options available, which, again, underlines the benefits from this shared evaluation.

One of the strong points of this report is that it results from the analysis of a large sample of patients, observed over more than 10 years. Nevertheless, several limitations can be highlighted, namely its observational and retrospective nature, prone to missing data, particularly on disease activity scores, both from Rheumatology and Dermatology.

Overall, the data obtained was consistent with previous studies, and represents the experience from the first PsA Clinic implemented in Portugal. The clinic's success has garnered attention from other centers throughout Portugal, highlighting the necessity and the benefits of a collaborative approach to the management of PsA patients. This recognition has prompted the development of a joint position paper aimed at providing guidance for newly established Rheumatology/Dermatology PsA clinics.[11] This clinic has also established itself as a national reference point for challenging cases, enabling other hospitals to refer individuals in need of specialized expertise. Although not a comparative study with patients observed under traditional care, it is worth underlining that many of these patients were already followed at either dermatology or rheumatology clinics and still benefited from this joint assessment.

Conclusion

This study shows the impact, through diagnostic precision and treatment modifications, from over 10 years of the implementation of a Rheumatology and Dermatology multidisciplinary PsA Clinic. Furthermore, it reinforces the usefulness of shared Rheumatology and Dermatology assessment and decision taking for the care of a large population of PsA patients.

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Disclosure

The author(s) report no conflicts of interest in this work.

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