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Not simply a matter of psoriatic arthritis: epidemiology of rheumatic diseases in psoriatic patients

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Statement of contributors
Dr. De Marco, Dr. Cattaneo and Dr. Marchesoni contributed to study design, data collection and analysis, report writing. Dr Battafarano and Dr Carrera contributed to data collection and analysis. Dr. Lubrano contributed to data analysis and report writing.
Dr. De Marco had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis, including statistics.

Abstract/Summary

Introduction: This study investigated the occurrence of rheumatic conditions (RCs) in a psoriasis(PSO)-dedicated dermatological clinic.

Methods: PSO subjects with musculo-skeletal discomfort, and/or carrying signs (articular/systemic, even asymptomatic) of RCs; and/or suffering flares of previously established psoriatic arthritis (PsA) were referred to rheumatologist for evaluation. Laboratory tests/imaging were performed as needed. Categorization adhered to RCs classification endorsed by the Italian Society of Rheumatology.

Results: Of 1200 psoriatic subjects, 277 (23.1%) were enrolled (146 females). The mean age was 55.7 years (range 21-81), PSO duration was 13.5 years (range 0-62). Thirty-seven patients (13.4%) were asymptomatic.

On average, 92 (7.6%) patients/year were evaluated, of whom 79.4% näive to rheumatological consultations (NRC). Osteoarthritis (OA) and PsA (isolated or combined) showed the highest prevalence, with 156 (56.3%) and 110 cases (39.7%), respectively. Among NRC subjects, the mean PsA annual incidence was 29.5% (standard error of the mean ± 5.4%). Other RCs, isolated or associated with PsA/OA, were diagnosed in 31 cases (11.2%). Thirty-two subjects (11.5%) had arthralgias, 20 of whom due to congenital/mechanical disorders, the remaining were unclassifiable.

Conclusions: The largest part (88.5%) of PSO subjects referred to rheumatologist showed some RCs. On annual basis, 29.5% of näive enrolled patients were diagnosed as PsA.

Introduction

Psoriatic arthritis (PsA) is a peculiar psoriasis (PSO)-associated condition, with prevalence and annual incidence among psoriatic subjects of 6-42% and 1.87%, respectively[5]. Up to 53% of PSO cases complain of musculo-skeletal symptoms[15], while the co-occurrence of other diseases like systemic auto-immune connective tissues diseases (SACDs) with PSO remains poorly investigated[4]. Evaluation of PSO patients attending dedicated dermatological clinics seems a reasonable mean to investigate the relationships between PSO and rheumatic diseases, although such approach may be troublesome in daily dermatological practice[14].

The aim of this study was to report the epidemiological results (the overall prevalence of rheumatic conditions, with a focus on prevalence and incidence of PsA) of the dermatologist-rheumatologist cooperation in a dermatological clinic appointed to diagnosis and treatment of PSO.

Methods

Study design

This was an observational, non interventional study on PSO patients, followed up in the dedicated clinic of Dermatology Department at Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, in Milano (Italy). PSO Patients are referred to this clinic from both primary care (dermatological, general practices) and other hospitals. This should prevent selection biases in terms of PSO severity and misdiagnosis. Since July 2008, a regular cooperation between rheumatologists and dermatologists was established.

Data reported in this paper were collected from July 2008 to July 2011, in consecutive subjects, according to the Declaration of Helsinki. All patients gave their informed consent before enrolment.

In order to check for misinterpreted PsA, candidates previously diagnosed as having PsA had their clinical notes completely reviewed.

Inclusion criteria

The patients enrolled were adults (older than 18 years), with established diagnosis of PSO (clinical or, if needed, histological), without limitations regarding any form or onset age of PSO.

Aiming to maximize sensitivity and decrease selection biases, all subjects followed up in the clinic were systematically interviewed and assessed, then referred to rheumatological evaluation whether they satisfied at least one of the following criteria:

a) presence of musculo-skeletal discomfort or joint swelling (current or past, spontaneously referred or elicited by the interviewing dermatologists);

b) presence, in dermatologist's opinion, of inflammatory signs (articular or not), limping and/or joint deformities, even in absence of symptoms;

c) flare of previously established PsA or other rheumatic disease.

Any current, past or experimental therapeutic regimen for PSO was allowed.

Although screening questionnaires are not extensively validated or compared "head to head"[8], patients were encouraged to fill in the psoriatic arthritis screening evaluation (PASE) questionnaire[9]. To maximize sensitivity, however, the results did not represent a cut-off criteria for enrolment.

Exclusion criteria

Subjects with psoriasis-like conditions (e. g. seborrhoeic dermatitis, eczema), were not eligible.

Data collection

Consensus core set domains for PsA[7] were used for data collection purposes. At enrolment, the psoriasis area and severity index (PASI) score[6] was calculated if enough skin was involved. Dermatologists and rheumatologists actively sought nail psoriasis (current, past).

Personal histories were carefully evaluated, along with previous medical reports (particularly synovial fluid analysis/biopsies). The presence of fatigue, morning stiffness and inflammatory back pain (defined according to Assessment of SpondyloArthritis International Society criteria[10]) were recorded.

Rheumatological examinations, performed by the same observer (GDM), aimed to disclose signs of musculo-skeletal inflammation (current, past, peripheral, axial), seeking for joint swelling/pain, dactylitis, pitting edema, entheseal soft swelling/tenderness, damaged/deformed joints, loss of articular motion/ankylosis,

subcutaneous nodules. Rheumatological counts (joints, dactylitic fingers/toes, tender entheses, tender points) were performed as well.

Signs of SACDs such as erythema nodosum, scleroderma, rashes (malar “butterfly” rash, Gottron’s papules), palpable purpura or ulcers (oral, genital, cutaneous) were routinely sought.

Laboratory tests such as blood cells count, erythrocyte sedimentation rate, C-reactive protein, rheumatoid factor (RF), anti-citrullinated peptide/proteins antibodies (ACPA), anti-nuclear antibodies (ANA), if clinically necessary, were performed according to widely accepted methods (Westergren, nephelometry, ELISA and immuno-fluorescence, respectively). Results were considered altered when above the upper limit of normal, according to local laboratories values.

Plain radiographs of painful/damaged sites were performed when clinically needed. Advanced imaging techniques (bone scans, computed tomography scans, nuclear magnetic resonances or ultrasonography) were performed in clinically selected cases.

Case definition of rheumatic disease

Patients were categorised according to the classification of rheumatic diseases endorsed by the Italian Society for Rheumatology (SIR) [12]. Briefly, rheumatic conditions are defined as: primarily musculo-skeletal (degenerative, inflammatory, infectious, metabolic); SACDs (e. g. systemic lupus erythematosus); extra-articular (e. g. fibromyalgia); bone diseases (e. g. osteoporosis); congenital/mechanical disorders (benign hypermobility syndrome, idiopathic scoliosis, flat feet); neoplasms (particularly those affecting synovium); others.

Case definition of PsA

Like several rheumatic conditions, PsA lacks of biological markers. Diagnosis relies on the interpretation of clinical, laboratory and imaging findings by a rheumatologist well-trained in the field of spondylo-arthropathies. In this study PsA cases were identified through expert opinion. For classification purposes, we adopted Vasey-Espinoza[13] and the ClASsification criteria for Psoriatic ARthritis (CASPAR)[11]. Other inflammatory conditions of joints, not attributable to well defined entities [like rheumatoid arthritis (RA)], were classified as undifferentiated arthritis (UA).

Statistical analysis

Continuous variables are described through means, medians, standard deviations (SD), standard errors of the means (SEM), absolute and inter-quartile (IQ) ranges. For the other variables, frequency tables, prevalences and incidences are reported. Confidence intervals (CI) were set on 95%.

For appropriate incidence calculation, subjects with PsA onset concurrent with PSO (at the same time or up to one year following PSO diagnosis) were excluded from this peculiar analysis.

To compare continuous variables we adopted Student's t test or Mann-Whitney's U statistic (where appropriate). Other differences were tested through χ^2 test or Fisher's exact test. Statistical level of significance was set on 0.01.

The software used was Epi info™, version 3.5.3, year 2011 (Centers for Disease Control and Prevention, Atlanta, GA, USA).

Results

Demographic and clinical characteristics

The dermatological clinic involved in this study follows up about 1200 PSO patients, who are on average middle-aged, with overall mild skin activity (table 1). By July 2011, 277 subjects (23.1%) were included in our study. Among these, 273 (98.6%) had some musculo-skeletal discomfort. While 240 (86.6%) reported arthralgias or back pain, 37 (13.4%) were symptom-less. Table 1 shows similar demographic and clinical characteristics between patients enrolled and the remaining PSO subjects, except for a slight, non significant difference in gender ratio.

TABLE 1 AND FIGURE 1 TO BE INSERTED HERE

Figure 1 depicts the proportions of different PSO forms among the 277 enrolled patients. Although plaque PSO was abundant, 6 patients (2.2%) had isolated nail involvement. All pustular PSO were localised, while no case of erythrodermia psoriatica was noted during this study among enrolled subjects.

At enrolment, 199 patients (71.8%) were receiving only topical or oral retinoid therapies. The remaining 78 were on systemic treatment (cyclosporine A, methotrexate, TNFα-inhibitors or systemic steroids). About previous therapies, 120 patients (43.3% of enrolled subjects) received at least one of the systemic drugs listed above and/or other biologics such as alefacept or efalizumab. These figures were comparable to those from the remaining psoriatic patients followed up in our clinic (figure 2), without statistical difference (a trend toward difference concerned only TNFα-inhibitors: χ^2 3.8, p value 0.049).

FIGURE 2 TO BE INSERTED HERE

Enrolment rates

On average, 92 subjects were enrolled each year (88 between July 2008-June 2009, 97 between July 2009-June 2010, 92 between July 2010-July 2011). Concurrently, the mean number of enrolled patients näive to rheumatological evaluations was 73±4.0 SEM (79.4% of those enrolled each year).

The diagram flow-chart of the enrolment procedures and detailed results is reported in figure 3.

The rheumatic diseases disclosed among enrolled patients are detailed in table 2.

FIGURE 3 AND TABLE 2 TO BE INSERTED HERE

a) Degenerative disorders

The largest part of enrolled patients had degenerative musculo-skeletal disorders, especially osteoarthritis (OA). Such condition was found alone or associated with PsA (e. g. secondary forms or primary forms concomitant with PsA). Overall, 47 cases of degenerative diseases overlapped with PsA, (42.7% of PsA).

Diffuse Idiopathic Skeletal Hyperostosis was a frequent cause of long-standing reduced spinal mobility. The cooperative approach adopted in this study facilitated the appropriate classification of such ankylosing degenerative disorder of the spine.

b) Inflammatory musculo-skeletal disorders

Extensive review of clinical notes retrieved 124 subjects (10.3% of PSO patients of the clinic) already diagnosed as PsA before enrolment. Among the 277 enrolled patients, 57 had already received the diagnosis of PsA, 45 of whom (78.9%) were confirmed after enrolment. Consequently, in the clinic population, PsA cases decreased to 112 (overall prevalence of 9.3%, 95% CI 9.25-9.35) before the beginning of enrolment procedures.

As shown in table 3, out of 110 PsA cases collected in our study by July 2011, 65 (59.1%) were newly diagnosed because of enrolment, 31 of whom (47.7%) suffered

the clinical onset of PsA within one year before enrolment. It has to be stressed that 14 of newly diagnosed PsA (21.5%) did not show peculiar inflammatory symptoms, or were asymptomatic. Forty-one enrolled subjects (all näive to rheumatological evaluations) agreed to fill in the PASE questionnaire (13 PsA, 28 non-PsA). Among PsA, 4 (30.8%) scored ≥47 (the original cut off value [6]), while 8 non-PsA (28.6%) reported similar results.

TABLE 3 TO BE INSERTED HERE

Applying classification criteria, 109 PsA subjects (99.1%) satisfied the Vasey-Espinoza criteria, while 99 (90%) satisfied CASPAR criteria. Interestingly, the single PsA case not satisfying Vasey-Espinoza rule had a CASPAR score of 3.

Newly diagnosed PsA cases already on systemic treatment at the time of enrolment did not show atypical clinical presentation, even those 8 (12.3%) on TNFα-inhibitors.

Cases of PsA onset concurrent with PSO onset were 5 (representing 2.8% of the whole clinic population and 4.5% of PsA among the enrolled subjects). On average, 21 subjects were incident cases of PsA each year (20, 27 and 18 respectively). On annual basis, the mean incidence of PsA in the clinic was 1.7% (SEM ±0.2%). However, considering those enrolled subjects näive to rheumatological evaluations, the mean incidence arose to 29.5% (SEM ±2.7%).

By July 2011, PsA cases increased to 177 in the whole clinic population, yielding a cumulative prevalence of 14.7% (95% CI 12.7-16.7).

Cases of chronic arthritis of uncertain origin (despite every investigation adopted) were infrequent among our patients. Such subjects would probably require a longer follow up to be properly classified.

One UA case overlapped with giant cells synovial tumour localised in the third right finger flexor tendon, but the patient had a bone erosion of the fifth meta-tarsal bone, suggestive of RA.

c) Auto-immune connective tissues disorders and vasculitidies

Polymyalgia rheumatica (a typical vasculitis of the elderly) was found in only one patient. Although ANA were positive in 11.9% of enrolled subjects (see below), SACDs cases were rare. The single case (0.4% among enrolled subjects) of Sarcoidosis ascertained in our series was enrolled because of finger flexor contraction due to tenosynovitis. Sarcoidosis was accidentally disclosed (after thoracic lymphonodal biopsy due to tuberculosis screening procedures). The cutaneous lesions of this patient were truly psoriatic and signs of erythema nodosum were never reported or found.

d) Metabolic musculo-skeletal disorders

Out of the 4 osteoporotic enrolled cases, 2 were post-menopausal and 2 senile. The 2 patients suffering from reflex sympathetic dystrophy had both OA and were enrolled because they were complaining of a painful, swollen ankle.

Out of 3 gouty subjects, one was enrolled because of subacute wrist arthritis. This patient was classified, after appropriate investigations (synovial fluid analysis, plain radiographies), as having PsA. The previous arthritic attack, ten years earlier, occurred in the left first metatarso-phalangeal joint (podagra) and was confirmed as gout through synovial fluid analysis report. Therefore, gout overlapped with PsA in 0.9% of cases.

e) Miscellaneous rheumatic diseases

Extra-articular disorders were frequently diagnosed. Fibromyalgia overlapped with PsA in 6 cases (5.4%). Such painful condition, as well as symptomatic idiopathic

scoliosis, flat feet or hip dysplasia, is not associated with objective inflammatory signs. Considering that the patients often reported symptoms that may simulate inflammatory disorders (e. g. prolonged morning stiffness), advanced imaging techniques (ultrasound tomography and nuclear magnetic resonance) were needed in order to classify such cases appropriately as non-inflammatory.

The occurrence of Raynaud's phenomenon also implied appropriate investigations, aimed to disclose SACDs. In all the patients affected by that vascular disorder, no abnormalities were found.

As well as SACDs, neoplasms of the musculo-skeletal system were also infrequently found. Although such conditions are often clinically well characterized, peculiar localizations (e. g. the joints of the hands) may complicate the differential diagnosis. In our case, surgical biopsy of the finger was needed.

f) Unclassifiable, non-inflammatory arthralgias

These cases, despite of any investigation, could not be classified. No single laboratory test or imaging technique revealed evidence of inflammatory lesions. After three years of follow up, none of these patients could be classified otherwise.

Laboratory tests findings

No enrolled patient had drops in blood cells count. Four PsA were RF positive, all of whom with oligo-arthritis and psoriatic nails (one case showed involvement of distal inter-phalangeal joints of the hands). None of these subjects had radiographic erosions suggestive of RA.

A title of ≥1:160 was found in 22 (66%) of the 33 ANA-positive enrolled subjects. Such auto-antibodies correlated with concurrent TNFα-inhibition therapies (7 subjects among ANA-positive versus 2 among negatives; odds ratio12.6, CI 2.5-64.6; χ^2=11, p value <0.001).

Discussion

To our knowledge, previous reports investigating rheumatic conditions among PSO subjects mainly focused on inflammatory joints manifestations[1] or SACDs [4] in a distinctive fashion.

Overall, the enrolment strategy adopted in this study (direct identification, by the dermatologist, of PSO patients in whom rheumatological referral could be useful) was straightforward and little time consuming, allowing the detection of several rheumatic disorders. Further, the systematic application, to each subject cared at our centre, of interviews and physical inspection by dermatologists allowed us to enrol a substantial proportion (13.4%) of asymptomatic patients.

Nevertheless, the most commonly referred subjects were those who complained of musculo-skeletal symptoms (mainly pain), occurring on average at the end of the fifth decade of life. Although this phenomena may be reported by up to 53% of all psoriatic patients[15], its fair attribution to PsA, OA, UA or Fibromyalgia may be difficult[14]. Further, our results highlight a consistent overlap of several rheumatic diseases (inflammatory and others).

Degenerative conditions were highly prevalent among enrolled subjects. Although our series shows demographic characteristics similar to others described elsewhere[3], such finding was expected, given the mean age of patients enrolled. It seems difficult to establish whether, in PSO subjects, degenerative conditions are more frequent than in general population. The medical literature, however, does report data [14,15] similar to ours.

PsA was the second more prevalent musculo-skeletal condition. Although in our clinic the mean annual incidence per 100 PSO cases was 1.7% (the same reported in another study[5]), each year 29.5% of those näive subjects eligible for

rheumatological consultation were diagnosed as PsA. Our referral strategy allowed us to disclose several new (incident) PsA cases, 47.7% of whom classifiable as early forms (clinical onset within one year) already carrying radiological damage in 32.3% of cases.

Considering the mild severity of cutaneous disease in our subjects, these findings seem particularly valuable, above all when compared to other publications[3]. Such characteristic was confirmed by the frequency of topical therapies. Nevertheless, some cases of PsA might have been hidden by systemic therapies (e. g. methotrexate).

Metabolic disorders were uncommon, although osteoporosis could have been strongly underestimated because bone densitometry was not systematically performed.

Auto-antibodies were infrequently detected (ACPA were less frequent than previously reported in PSO[2]), or related to anti-TNFα therapies. The only two cases of Raynaud's phenomenon were not associated to SACDs, and we diagnosed a single case of Sarcoidosis. Our data seem to support other findings [4] about the infrequent co-occurrence of SACDs and PSO, although such issue requires further studies.

It has to be stressed that several enrolled patients (11.5%) suffered from musculo-skeletal discomfort due to mechanical conditions or unexplained arthralgias. Such cases required more diagnostic investigations (particularly advanced imaging techniques) and seemed at greater risk of PsA misdiagnosis or inappropriate exposure to immuno-suppressive drugs.

This study has some limitations. The number of enrolled subjects (277 patients) was not large enough to disclose rare, concomitant diseases (<0.1%). Further, patients scarcely symptomatic may have been missed, especially among those not referred

by dermatologists. Indeed, although this study was not designed to report about the adequacy of referral criteria, the authors trust that the inclusion strategy, the systematic approach, the close cooperation between rheumatologists and dermatologists and the length of the observation period (37 months) should have maximized the sensitivity of our results. Finally, since laboratory and imaging investigations were performed, when indicated, only among enrolled patients, several conditions might have been missed.

In conclusion, rheumatic disorders are frequent in PSO subjects. Although mostly resulted non-inflammatory, 29.5% of enrolled subjects näive to rheumatological evaluation had PsA. Cooperative approaches between dermatologists and rheumatologists, as the one described, seem to be a powerful tool for detection of early PsA and for management of rheumatic disorders in PSO patients.

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Tables

Table 1 demographic and clinical characteristics of the subjects enrolled in the present study (SE), compared to the remaining psoriatic population (RPP). Psoriatic patients cared at our clinic are 1200.

	SE (n 277)	**RPP** (n 933)	**p value**
Sex (M/F); ratio	131/146; 0.9	489/444; 1.1	0.15
Current age in years, mean (SD)	55.7 (13)	55.3 (14.6)	0.68
PASI score, median (IQR)	3.1 (1.2-5.8)	3 (1.4-6)	0.76
Subjects with PASI score ≥ 10, number (%)	34 (12.3)	104 (11.1)	0.68
Subjects with nail psoriasis, number (%)	116 (41.9)	419 (44.9)	0.41
Age at psoriasis onset in years, mean (SD)	42.1 (17.1)	41.6 (17.3)	0.67
Interval between psoriasis onset and current age in years, median (IQR)	10 (4-18)	10 (4-19.2)	0.75
Age at musculo-skeletal symptoms onset in years, mean (SD)	50.1 (13)	NA	/

M = male; F = female; NS = not significant; SD = standard deviation; PASI = Psoriasis Area and Surface Index; IQR = inter-quartile range; NA = not assessed

1

Table 2 Frequencies of rheumatic conditions among the 277 subjects enrolled. The disorders enlisted may overlap unless specified(§)

	Number of cases (%)
a) Degenerative musculo-skeletal disorders	
• Osteoarthritis	156 (56.3)
• Diffuse idiopathic skeletal hyperostosis	16 (5.8)
• Shoulder peri-articular degeneration	10 (3.6)
• Hip peri-articular degeneration	2 (0.7)
b)Inflammatory musculo-skeletal disorders	
• Psoriatic Arthritis	110 (39.7)
• Undifferentiated arthritis	2 (0.7)
c) Auto-immune connective tissues disorders/vasculitidies	
• Polymyalgia rheumatica	1 (0.4)
• Sarcoidosis§	1 (0.4)
d) Metabolic musculo-skeletal disorders	
• Osteoporosis (post-menopausal or senile)	4 (1.4)
• Gout	3 (1.1)
• Chondrocalcinosis	3 (1.1)
• Reflex sympathetic dystrophy	2 (0.7)
• Emochromatosis	1 (0.4)
e) Miscellaneous rheumatic diseases	
• Arthralgia secondary to congenital/mechanical conditions§*	20 (7.2)
• Fibromyalgia	15 (5.4)
• Idiopathic Raynaud's phenomenon	2 (0.7)
• Giant cells synovial tumour	1 (0.4)
f) Unclassifiable, non-inflammatory arthralgias§	12 (4.3)

*such as hypermobility syndrome, idiopathic scoliosis, flat feet, hip dysplasia (congenital or developmental)

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Table 3 demographic and clinical characteristics of previously established Psoriatic Arthritis (PE PsA), compared to newly diagnosed PsA (ND PsA)

	PE PsA (n 45)	**ND PsA (n 65)**	**p value**
Gender (M/F); ratio	27/18; 1.5	38/27; 1.4	0.97
Current age in years, mean (SD)	53.1 (14.2)	53.4 (13.9)	0.92
PASI score, median (IQR)	4.7 (2.4-8)	4.2 (2-6.5)	0.4
Subjects with PASI score ≥ 10, number (%)	10 (22.2)	10 (15.3)	0.5
Subjects with nail psoriasis, number (%)	23 (51.1)	26 (40)	0.33
Age at psoriasis onset in years, mean (SD)	35.8 (17)	41.5 (15.7)	0.07
Interval between psoriasis onset and current age in years, median (IQR)	13 (8-24)	9 (4-16)	0.006
Age at musculo-skeletal symptoms onset in years, mean (SD)	43.6 (13.2)	50.4 (13.9)	0.011
Onset of PsA ≤ 1 year since enrolment	6 (13.3)	31 (47.7)	<0.001
Onset of PsA ≥ 5 years since enrolment	21 (46.7)	5 (7.7)	<0.001
Peripheral oligo-arthritis	17 (37.8)	40 (61.5)	0.02
Peripheral poly-arthritis	20 (44.4)	14 (21.5)	0.019
Axial PsA	12 (26.7)	5 (7.7)	0.015
Clinical articular damage due to PsA	20 (44.4)	16 (24.6)	0.049
Radiological damage due to PsA	21 (46.7)	21 (32.3)	0.18
Subjects with altered ESR, number (%)	13 (28.9)	30 (46.1)	0.1
Subjects with altered CRP, number (%)	16 (35.6)	23 (35.4)	0.85
Subjects with positive RF, number (%)	1 (2.2)	3 (4.6)	0.88
Subjects with positive ACPA, number (%)	0 (0)	1 (1.5)	0.85
Subjects on systemic treatments active on PsA*	25 (55.5)	14 (21.5)	<0.001

M = male; F = female; NS = not significant; SD = standard deviation; PASI = Psoriasis Area and Surface Index; IQR = inter-quartile range; ESR = erythrocyte sedimentation rate; CRP = C-reactive protein; RF = rheumatoid factor; ACPA = anti-citrullinated peptides/proteins antibodies

*Such treatments are cyclosporine A, methotrexate, TNFα-inhibitors

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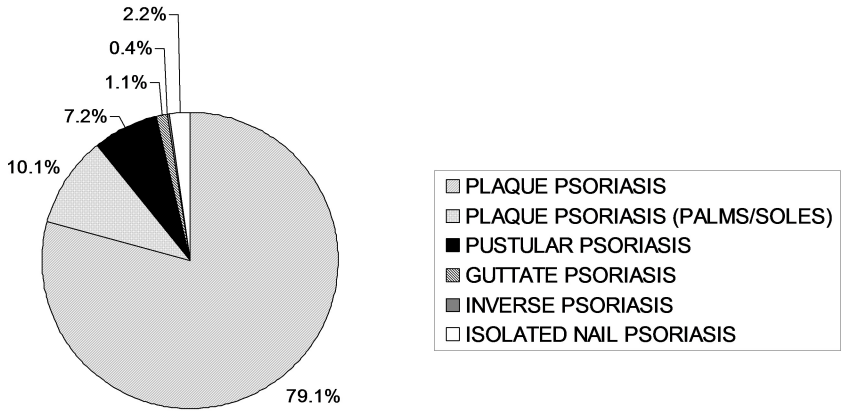
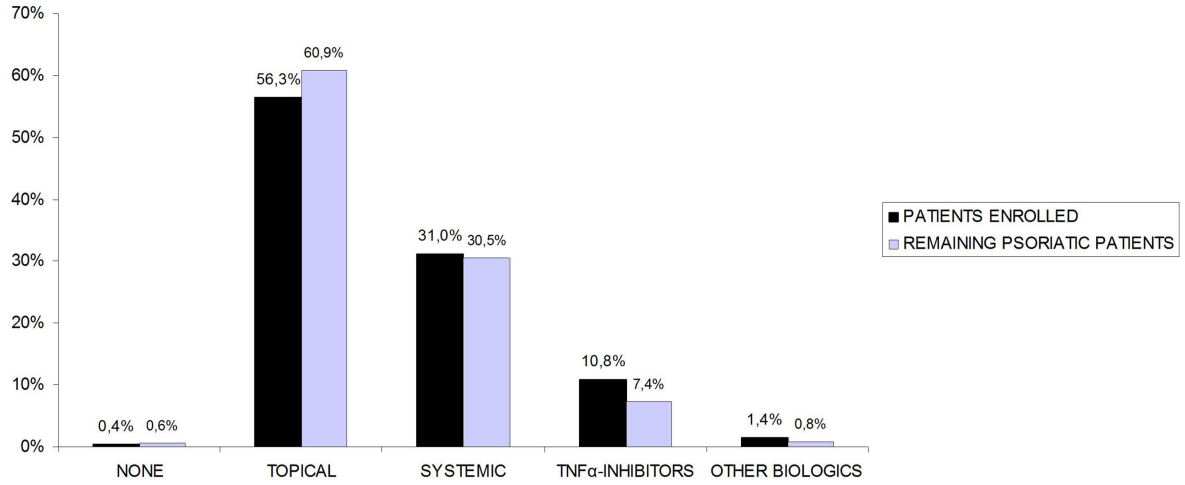
Figures and related legends

Figure 1



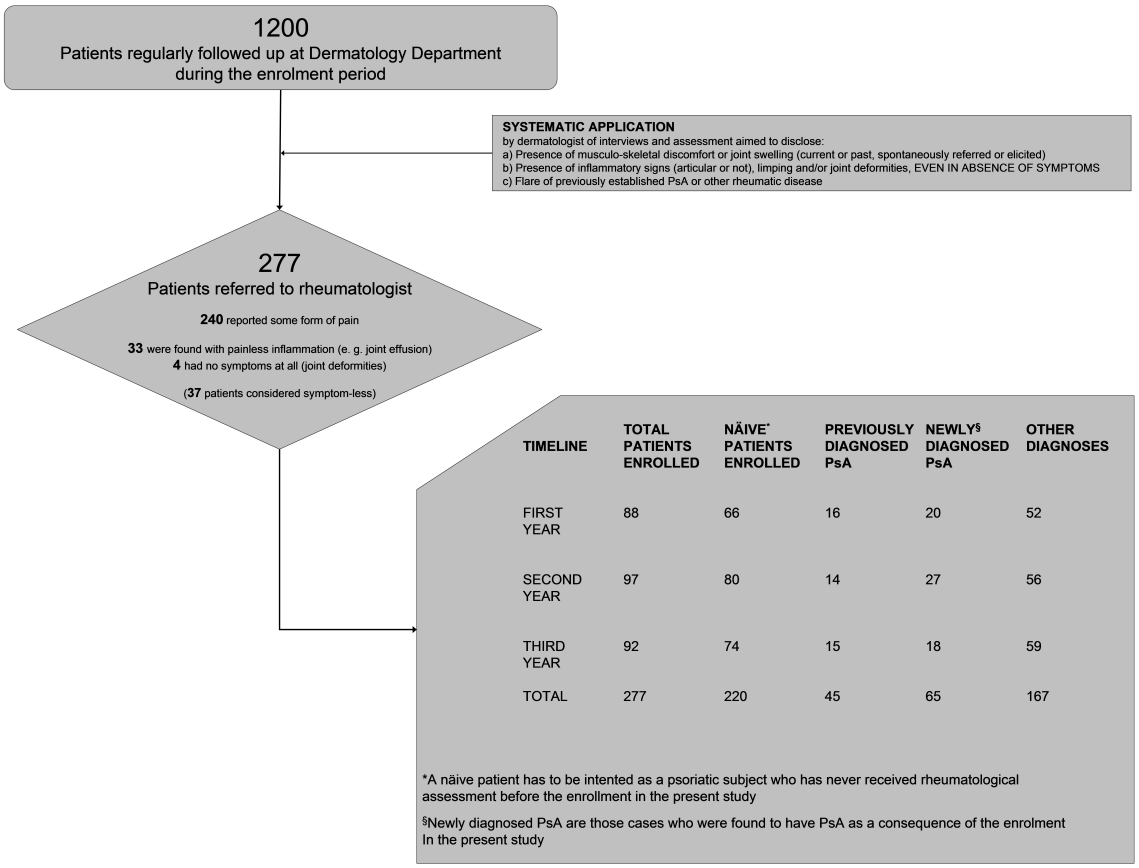
details about the forms of psoriasis diagnosed among the enrolled subjects. No patient presented erythrodermia psoriatica during the observation period (37 months).

Figure 2



Dermatological therapies, ever done. Enrolled patients (n 277) are depicted in black, the remaining psoriatic subjects followed up in the clinic (n 933) are depicted in grey. Topical therapies are corticosteroids or vitamin D derivatives or salicylic acid in form of creams, ointments or lotions; systemic therapies are oral retinoids or oral steroids, cyclosporine A, methotrexate, mophetil mycophenolate; other biologics are alefacept or efalizumab.

Figure 3



Flow chart diagram of the study. The outcomes of the identification process, stratified by the years of enrollment, are illustrated.

PsA = psoriatic arthritis

Abbreviations and acronyms list

ACPA = anti-citrullinated peptide/proteins antibodies

ANA = anti-nuclear antibodies

CASPAR = ClASsification criteria for Psoriatic Arthritis criteria

OA = osteoarthritis

PASE = psoriatic arthritis screening evaluation questionnaire

PASI = psoriasis area and severity index

PsA = psoriatic arthritis

PSO = psoriasis

RF = rheumatoid factor

RA = rheumatoid arthritis

SACDs = systemic auto-immune connective tissues diseases

SIR = the Italian Society for Rheumatology

UA = undifferentiated arthritis