Prevalence, Disease Manifestations, and Treatment of Psoriatic Arthritis in Western Norway

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ABSTRACT. ***Objective.*** To estimate the prevalence of psoriatic arthritis (PsA) in a geographically defined population, and to characterize the clinical manifestations and medical treatment for PsA.

Methods. Prevalent cases were identified for the years 1999-2002 at the rheumatology centers for the population of 442,000 inhabitants. Clinical data were extracted from patient records. Cases with psoriasis and peripheral arthritis and/or radiographic evidence of spondyloarthritis were considered to have PsA, those with other arthritides were excluded.

Results. In total, 634 patients with PsA were identified from the adult population, equivalent to a prevalence of 1.95 per 1000 (1.80–2.10). There were no significant sex differences in rates; for both sexes the prevalence was highest in the age group 40 to 59 years. Polyarthritis was the most frequent subclass (68.6%). Oligoarthritis, monoarthritis, and arthritis confined to the spine or sacroiliac joints were seen in 22.9%, 5.8%, and 2.7% of cases, respectively. Mean age was higher (50.6 yrs for all cases), and mean disease duration was longer (10.7 yrs) with increasing number of joints affected. The mean erythrocyte sedimentation rate and C-reactive protein were higher with increasing number of joints affected and disease duration. Intraarticular injection of glucocorticoids had been administered to 40.0% of the patients during the last year. Disease modifying antirheumatic drugs were used by 40.0%, with oral methotrexate being the most frequently used.

Conclusion. The estimated prevalence of PsA was 1.95 per 1000 adult inhabitants, which is higher than previously reported. The demographic data support the presence of a shift from mono- and oligoarthritis to polyarthritis and increased inflammatory activity with increasing disease duration. Methotrexate and intraarticular glucocorticoids were frequently used treatments. (J Rheumatol 2005;32:1918–22)

Key Indexing Terms:
PSORIATIC ARTHRITIS PREVALENCE DISEASE MANIFESTATIONS
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Psoriatic arthritis (PsA) is an inflammatory joint disease associated with psoriasis. In addition to coincidence of psoriasis and arthritis, PsA is characterized by various clinical features, i.e., involvement of distal interphalangeal (DIP) joints, asymmetry, spondyloarthritis (SpA), dactylitis, and enthesitis[1]. The variability in clinical presentation led to the description by Moll and Wright[2] of 5 clinical subclasses: (1) Arthritis with predominantly distal interphalangeal (DIP) joint involvement; (2) arthritis mutilans; (3) symmetric polyarthritis — indistinguishable from rheumatoid arthritis (RA); (4) asymmetric oligoarthritis; and (5) predominantly SpA. The term "psoriatic arthritis sine psoriasis" is sometimes used in cases with inflammatory joint disease with clinical characteristics of PsA but without skin lesions[3].

However, at an individual basis it may be difficult to distinguish PsA from other inflammatory joint diseases in a patient with psoriasis, i.e., RA, ankylosing spondylitis (AS), and enteropathic arthritis. This distinction is based on clinical, serological, and radiographic features[1]. The absence of a validated case definition of PsA represents one of the difficulties in comparing the prevalence of the disease in different studies. Previous studies have reported prevalences of PsA at about 1 per 1000[4]. Apart from a small study of a Lapp population in Norway[5] and a health interview survey of patients with psoriasis[6], to our knowledge epidemiologic studies of PsA have not been performed in Norway. A recent study from Finland[7] estimated the annual incidence of inflammatory joint diseases, and found PsA to be the most frequent presentation of arthritis after RA.

Our aim was to estimate the prevalence of PsA in the population of the county of Hordaland in Western Norway.

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Further, we wished to characterize the clinical manifestations of the disease and describe the medical treatment patients were receiving.

MATERIALS AND METHODS

According to Statistics Norway the county of Hordaland had 441,660 inhabitants at January 1, 2003 (9.7% of the Norwegian population), among whom 321,454 were age 20 years or older. Fifty-four percent lived in Bergen, which is the regional center. In order to include a major percentage of the prevalent cases, patients with PsA were identified from the diagnostic codes for the period 1999-2002 at the 4 rheumatology centers that serve the population. These are the Department of Rheumatology of the University Hospital in Bergen, Haugesund Rheumatism Hospital (located south of the county), and 2 private rheumatologists in Bergen. The hospitals used the International Statistical Classification of Disease and Related Health Problems-10 (ICD-10)[8], and records for patients with the following codes were assessed for inclusion: L40.5 (Arthropathic psoriasis), M07.0-3 (Psoriatic arthropathies), and M46.1,8-9 (Sacroiliitis/inflammatory spondylopathies). The private rheumatologists identified the patients individually. Data about skin and joint manifestations and treatment of PsA as well as laboratory and radiographic data as described by a radiologist were extracted from the patient records. Radiographs of hands, feet, sacroiliac (SI) joints, and thoracolumbar spine obtained during the last 3 years were considered. Laboratory data included erythrocyte sedimentation rate (ESR), C-reactive protein (CRP, normal value < 10 mg/l), HLA-B27 antigen, antinuclear antibodies (ANA), and Waaler's test for rheumatoid factor (RF). The cutoff value for a positive RF and ANA was titer of 128 or ELISA 1.65 for ANA. The most recently obtained values for ESR and CRP were considered.

Case definition. All patients seen at a department of rheumatology (n = 540) and the majority of patients seen only by a private rheumatologist (n = 94) had the diagnosis of psoriasis confirmed by a dermatologist. Palmoplantar pustulosis was regarded as a variant of psoriasis. Peripheral arthritis was considered present if there had ever been tender and swollen joints assessed by a rheumatologist. Patients with psoriasis and peripheral arthritis were considered to have PsA, but RA if rheumatoid nodules were present. Presence of SpA was based on radiological evidence of sacroiliitis, paravertebral ossification, or syndesmophytes in the spine as assessed by a radiologist in a clinical setting. If the radiographic features of SpA were asymmetric or unilateral[9], or if polyarthritis was present as well, the patient was considered to have PsA, or otherwise AS. Patients with crystal induced arthritis, reactive arthritis, connective tissue disease, or osteoarthritis (OA) were excluded. The patients with PsA were grouped into subclasses according to accumulated disease pattern at their last visit in the study period: that is, monoarthritis, oligoarthritis (2 to 4 joints affected), polyarthritis (≥ 5 joints affected), and SpA without peripheral arthritis. In addition, presence of arthritis mutilans was recorded, defined as shortened fingers with excessive skin folds, hypermobile joints, and digits that could be elongated by traction[10].

Statistical analyses. Statistical analyses were performed using SPSS 9.0.0 software (SPSS Inc., Chicago, IL, USA). Prevalence rates were estimated by dividing the number of prevalent cases by the population as obtained from Statistics Norway for January 1, 2003. We calculated 95% confidence intervals (CI) for prevalence rates with binomial distribution. Descriptive statistics were used to analyze the clinical manifestations and treatment. We used parametric tests with a 2-sided significance level of 0.05. For continous data we used t test/one-way analysis of variance (ANOVA) to test for differences between groups; for categorical variables the chi-square test was used. The mean and standard deviation were used as estimates of central tendency and dispersion. The independent relationship between age, disease duration, CRP, and type of joint affected (mono- or oligo- vs polyarthritis) was examined in a forward logistic regression model, yielding the parameter odds ratio (OR) and the 95% CI.

RESULTS

Prevalence and demographics. We identified 634 adults with PsA living in Hordaland; 53% were male. The estimated prevalence was 1.95 per 1000 adult inhabitants (95% CI 1.80-2.10). Age group and sex-specific prevalences are presented in Table 1. There were no significant differences in rates between men and women: for both sexes the prevalence rate was highest in the age group 40 to 59 years. Prevalence in the city of Bergen was comparable to that of the surrounding rural regions. Demographic data for patients are shown in Table 2. Mean age at last visit was 50.6 years (SD 14.9), and was higher with increasing number of joints affected ($p < 0.05$). Similarly, the mean disease duration, 10.7 years (SD 8.8) for all patients, was longer with increasing number of joints affected. There was no significant sex difference between the subclasses.

Clinical manifestations. Palmoplantar pustulosis was the dominating skin manifestation in 6.2% of patients; the remainder had plaque psoriasis. Polyarthritis was the most frequent subclass (Table 2), documented in 68.6% of the patients. Oligoarthritis had been found in 22.9% of patients, and monoarthritis in 5.8%. Exclusive DIP joint involvement was not found in any patient, and only 4 (0.6%) had arthritis mutilans. The type of joints ever affected by arthritis is shown in Table 3. Proximal interphalangeal joints, knees, metacarpophalangeals, or metatarsophalangeal joints were each involved in more than half of the cases, and dactylitis had been present in 11.7%. Radiographic assessment of SI joints had been performed in 39.4% of cases, and evidence of SpA was present in 33.6% of these. SpA without peripheral arthritis was seen in 2.7% of all cases. Because of few patients in this group, only cases with peripheral arthritis were considered in the statistical comparison of disease manifestations and treatment (Table 4). When considering the 2 main groups of peripheral arthritis (mono/oligoarthritis and polyarthritis) as dependent variables, we identified the following parameters independently associated with type of joint involvement: age (OR 1.03, 95% CI 1.01–1.04), disease duration (OR 1.06, 95% CI 1.03–1.09), and CRP (OR 1.03, 95% CI 1.01–1.05).

Laboratory variables and radiographic features. Positive RF was found in 4.1% of all cases, and ANA in 4.1%. HLA-B27 was present in 27.3% of the patients with peripheral arthritis who had been examined for this (Table 4), but in 41.7% of those with PsA confined to SI joints or spine ($p <$

Table 1. Prevalence of psoriatic arthritis (per 1000). Total prevalence: 1.95 per 1000 (95% CI 1.80–2.10).

Age, yrs	Men (95% CI)	Women (95% CI)
20–39	1.47 (1.17–1.76)	0.98 (0.73–1.23)
40–59	2.83 (2.40–3.26)	2.33 (1.93–2.73)
≥ 60	2.09 (1.61–2.57)	2.24 (1.81–2.67)
Total	2.11 (1.88–2.34)	1.80 (1.59–2.0)

Table 2. Demographic data and subclassification of 634 patients with PsA.

	Subclasses					
	Monoarthritis	Oligoarthritis	Polyarthritis	Spondyloarthritis Exclusively	p	Total
No. of patients (%)	37 (5.8)	145 (22.9)	435 (68.6)	17 (2.7)		634 (100)
Mean age, yrs (SD)	39.8 (10.3)	47.4 (15.3)	52.7 (14.6)	49.5 (13.3)	< 0.05*	50.6 (14.9)
Mean disease duration, yrs (SD)	4.8 (4.5)	8.4 (8.1)	11.8 (8.9)	11.1 (10.4)	< 0.05**	10.7 (8.8)
Male (%)	15 (40.5)	80 (55.2)	237 (54.5)	4 (23.5)	***	336 (53.0)

* $p < 0.05$ for differences between all groups of peripheral arthritis (ANOVA). ** $p < 0.05$ for differences mono- vs polyarthritis and oligo- vs polyarthritis. No significant difference for mono vs oligoarthritis (ANOVA). *** No significant difference between the subgroups of peripheral arthritis. $p < 0.05$ for difference between peripheral arthritis and spondyloarthritis (chi-square test).

0.05). The mean ESR and CRP were higher in patients with polyarthritis than in those with mono- or oligoarthritis ($p < 0.05$). Radiographic signs of arthritis in hands or feet had been described in 55.6% of the patients assessed for this, and 45.2% of these had features typically seen in PsA, such as DIP joint erosions, joint osteolysis, and juxtaarticular bone formation. Of all cases with sacroiliitis, 34.0% had unilateral or asymmetric changes.

Treatment of PsA. Within the year prior to the last rheumatological consultation, 40.0% of the patients with peripheral arthritis had received one or more intraarticular steroid injections (Table 4). This treatment was equally frequent in the polyarthritis and mono/oligoarthritis subgoups, as was the use of nonsteroidal antiinflammatory drugs (NSAID). At the last visit in the study period, 77.3% of these patients used some NSAID, of which 32% were cyclooxygenase-2 selective. Disease modifying antirheumatic drugs (DMARD) were used by 40.0% of those with peripheral arthritis, and oral prednisolone in daily doses between 2.5 and 10 mg was used by 7.9%, mainly patients with polyarthritis. Methotrexate (MTX), alone or in combinations, was used by 66.1% and 4.4% of the DMARD users, respectively. Sulfasalazine constituted 13.3%, leflunomide 5.2%, and hydroxychloroquine 4.8% of the DMARD used, while gold, cyclosporine, and azathioprine constituted less than 3.5% each. Biological agents were used by 1.7% of all patients (infliximab 7, etanercept 3, and anakinra 1).

Table 3. Joints affected by arthritis in 634 patients with PsA.

	No. of Patients (%)
PIP	348 (54.9)
Knees	346 (54.6)
MCP	332 (52.4)
MTP	332 (52.4)
Wrists	279 (44.0)
DIP	228 (36.0)
Ankles	188 (29.7)
Elbows	130 (20.5)
SI joints*	84 (33.6)
Shoulders	80 (12.9)
Hips	38 (6.0)

* Assessed in 39.4% of the cases. PIP: proximal interphalangeal, MCP: metacarpophalangeal, MTP: metatarsophalangeal, DIP: distal interphalangeal, SI: sacroiliac.

DISCUSSION

The estimated prevalence of PsA was 1.95 per 1000 in the adult population. In comparison, the Rochester Epidemiologic Project of Olmsted County, Minnesota, USA, reported a prevalence rate at 1.01[11]. A study from Greece[12] found a prevalence rate at 0.57, but they used the Preliminary European Spondylarthropathy Study Group criteria[13] for

Table 4. Laboratory/radiographic data and treatment for the PsA patients with peripheral arthritis.

	Mono/Oligoarthritis, n = 182	Polyarthritis, n = 435	p	Total, n = 617
Mean ESR, mm/h (SD)	16.0 (14.8)	22.7 (17.6)	< 0.05	20.7 (17.1)
Mean CRP, mg/l (SD)	8.8 (15.0)	13.5 (17.9)	< 0.05	12.1 (17.3)
Positive HLA-B27†, n (%)	28 (28.0)	60 (27.0)	*	88 (27.3)
Radiographic arthritis, hands or feet††, n (%)	17 (26.2)	208 (61.2)	*	225 (55.6)
Intraarticular steroid injection last year, n (%)	74 (40.7)	173 (39.8)	0.84	247 (40.0)
NSAID use currently, n (%)	134 (73.6)	343 (78.9)	0.17	477 (77.3)
Prednisolone use currently, n (%)	6 (3.3)	43 (9.9)	< 0.05	49 (7.9)
DMARD use currently, n (%)	22 (12.1)	225 (51.7)	< 0.05	247 (40.0)
Biological agents, n (%)	1 (0.5)	10 (2.3)	0.13	11 (1.8)

† HLA-B27 determined in 322 cases. †† Radiographics obtained from 405 cases. * No statistics due to missing values.

PsA. As noted, the lack of universally agreed or validated case definitions for PsA may be one reason for discrepancy in the literature regarding prevalence.

The county of Hordaland has natural boundaries with surrounding regions and has a stable population. Only residents of the county were included, and by using unique personal identification numbers we also identified residents of the county that had attended Haugesund Rheumatism Hospital, located south of the county. These factors increased the sensitivity of identifying prevalent cases. Based on thorough collection of data from patient records we excluded patients that had been coded incorrectly as PsA. A calculation of the positive predictive value of this coding yielded 60.3%. By investigating a number of patients (n = 100) coded with other arthritides, we calculated the negative predictive value of the coding to be 99.0%.

Some factors in the study may have influenced an underestimation of prevalence. PsA is known for a variable clinical course and may enter remission[14]. Thus some patients may not have sought rheumatological attention during the study period, and this may explain the lower prevalence rates that we found in elderly patients. Cases with mild or self-limiting arthritis may also not have been identified. Arthritis that preceded psoriatic skin lesions would not be recognized as PsA, and arthritis confined to the SI joints or the spine remains unrecognized unless radiographic features of SpA are assessed. We considered peripheral arthritis to be present once a rheumatologist had diagnosed swollen and tender joints, thus we may have included some patients with self-limiting arthritis. This may conceivably have contributed to overestimation of the prevalence of PsA. For a small number of the prevalent cases the diagnosis of psoriasis had not been confirmed by a dermatologist. Assuming that some of these did not have psoriasis, the effect on the calculated prevalence rates would still be negligible due to the small number of such patients. The finding of positive RF in 4.1% of the cases is in agreement with studies of blood donors at our clinic[15], but RF positivity may also indicate that some patients with RA were included. The use of patient records gives data for both the cumulated disease course and a cross-section at the last visit, but as a source for radiographic data it reflects everyday practice, and this may have influenced the assessment of an arthritis case as PsA, AS, or OA. We found PsA confined to the SI joints or the spine in only 2.7% of the cases, and there were fewer men in this group than expected. This may be explained by the fact that relatively few patients had been radiologically assessed for SpA, and by a bias toward diagnosing men with SpA with AS instead of PsA.

Considering this discussion, we believe our prevalence rates are not likely to be biased to overestimation, and that the true prevalence of PsA in our region is higher than indicated in previous studies. The study of inflammatory joint diseases in Finland[7] reported an incidence of PsA about two-thirds that of RA, which also indicates that PsA is more common than previously documented.

According to both a Norwegian health interview survey[16] and a study of a Norwegian Lapp population[5], the overall prevalence of psoriasis was 1.4%, with no difference between men and women. Using the prevalence of PsA in our study, the calculated prevalence of PsA among psoriatic adults is 14%. In comparison, a Swedish study of psoriatics who responded to a questionnaire found that 33% of patients with psoriasis had previous or actual peripheral arthritis and/or axial disease[17], and a survey of members of the Nordic Psoriasis Patient Organisation found that 33.8% of the Norwegian members reported they had been diagnosed with PsA by a rheumatologist or dermatologist[6].

With increasing number of affected joints, the mean age of the patients was higher and the mean disease duration longer. This may reflect that patients who present with mono- or oligoarthritis tend to evolve to polyarthritis over time. Such a shift from oligo- to polyarthritis has been described in other studies[18,19]. The inflammatory indicators ESR and CRP were higher with longer disease duration, and higher for patients with polyarthritis than for those with mono- or oligoarthritis. This may indicate a higher general disease activity over time as more joints are affected. The distribution of the different subclasses of PsA in the study is similar to previous findings[18] where the patients had about the same disease duration (12 years) as our patients. Our findings of HLA-B27 must be interpreted with caution because of missing data, but are in accord with studies that showed that HLA-B27 is strongly associated with axial disease, but weakly with peripheral arthritis[19].

Intraarticular injections of glucocorticoids had been administered frequently to patients in our study. To our knowledge this treatment method is not specifically studied in PsA, but is mentioned in some textbooks and in a review of treatment of PsA[20]. The use of such injections in arthritis is described in a survey among Norwegian rheumatologists, who generally consider this a very effective treatment with few side effects[21]. The wide use of joint injections may be seen in connection with a relatively low frequency of DMARD use (40%). In 2 studies of early PsA[22,23], DMARD were used by 84% and 56% of the patients, respectively, after 2 years' disease duration. This difference may be related to different study designs (prospective vs our cross-sectional study) or to differences between patients with short and long disease duration. In a comparable review of 221 outpatients with PsA with a median 10 years' disease duration[24], 47.5% of the patients used some DMARD, and this is more in line with our findings. In contrast to these studies, where sulfasalazine and MTX were the most frequently used DMARD, only 13.3% of the patients taking DMARD in our study used sulfasalazine, while 70.5% used MTX. This is in accord with a survey of rheumatologists in Philadelphia, who ranked MTX as the most effective drug

for treating peripheral PsA[25]. Few patients were treated with biological agents; infliximab was introduced, and etanercept was not yet approved for treating patients with PsA during the study period.

We found a higher prevalence rate of PsA than previously reported. Polyarthritis was the most frequent subclass, and the demographic data support the presence of a shift from mono- and oligoarthritis to polyarthritis and increased inflammatory activity with increasing duration of the disease. MTX was the most frequently used DMARD, and patients were frequently treated with intraarticular injections of glucocorticoids.

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