Chapter 9

Ankylosing spondylitis patients with and without psoriasis do not differ in disease phenotype

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Psoriasis is an important clinical feature in ankylosing spondylitis (AS) and spondyloarthritis (SpA) in general,[1] with inflammatory spinal disease developing in 5% 25% of psoriasis cases.[2,3] However, there have been few studies assessing the differences between AS patients with and without concomitant psoriasis.[4–9] Our aim was to compare the demographic, clinical and imaging characteristics between AS patients with and without psoriasis. Baseline data from an 80% random sample of the AS Study for the Evaluation of Recombinant Infliximab Therapy (ASSERT) database were used for this analysis. Details of the ASSERT trial and study population have been previously published.[10] Briefly, patients with active AS (fulfilling modified New York criteria) for at least 3 months, a Bath AS disease activity index score of at least 4 (range 0–10) and a spinal pain assessment score of at least 4 (range 0–10) were eligible for the study. AS patients with psoriasis (n=20) were similar to AS patients without psoriasis (n=191–201) (table 1), namely, regarding baseline demographic characteristics (age, disease duration, body mass index and sex), genetic features (human leukocyte antigen-B27 positivity), presence of extra-articular manifestations (uveitis and inflammatory bowel disease), disease activity measures (AS disease activity score, Bath AS disease activity index, patient global assessment and C-reactive protein), severity of enthesitis (Mander enthesitis index), measures of spinal mobility (individual measures and the Bath AS metrology index), physical function (Bath AS functional index), health related quality of life (36-item short form health survey), spinal radiographic damage (modified Stoke AS spine score), location of damage in cervical versus lumbar spine and MRI inflammation of the spine (AS spine MRI score for activity). The only difference that we found was regarding the number of swollen joints. However, this difference did not seem clinically relevant (average 2.4±3.9 swollen joints in patients with psoriasis vs 1.6±3.5 in patients without psoriasis) and the swollen joint count was not independently associated with the presence of psoriasis in the logistic regression analysis (table 1). Probability plots for several outcome measurements were created and stratified for AS patients with and without psoriasis, confirming the similarity between groups at the individual level (figure 1). In this study, we found that demographic characteristics, disease activity, spinal mobility, physical function, structural damage and quality of life are comparable between AS patients with and without psoriasis. Previous studies, performed in heterogeneous populations (early inflammatory back pain, axial psoriatic arthritis and AS patients) have shown conflicting results.[4–9] One of the advantages of our study is the large number of disease variables that were studied. One of the limitations of our study is the low number of patients with psoriasis (20 patients, 10% of the study population), increasing the risk of type II error (ie, the failure to reject a false null hypothesis). Furthermore, this is a clinical trial cohort of patients with severe and active disease fulfilling modified New York criteria for AS; therefore, results are not generalisable to other axial SpA subgroups. Importantly, futures studies should focus on the whole spectrum of axial SpA patients, including patients with radiographic and non-radiographic axial SpA.[1] The application of the axial SpA paradigm can be a particularly useful and unifying concept, given

the long-standing debate on the question of whether patients with inflammatory back disease and psoriasis represent AS with psoriasis or psoriatic spondylitis.[1,3]

Table 1. Comparison of baseline demographic, genetic, clinical and imaging characteristics of patients with and without psoriasis in the study cohort

Variable	No psoriasis (N=191–201)*		Psoriasis (N=20)				
	Mean (SD) or number (%)	**Median (IQR)**	**Mean (SD) or number (%)**	**Median (IQR)**	**p Value† (psoriasis vs no psoriasis)**	**OR (95% CI)‡**	**Adjusted OR (95% CI)§**
Age (years)	39.3 (10.4)	40 (32–46)	40 (7.4)	40.5 (36–47)	0.629	–	–
Disease duration (years)	10.5 (8.6)	8.6 (3.1–16.1)	13.2 (9.7)	13.4 (3.6–20)	0.217	–	–
BMI (Kg/m^2)	25.6 (4.1)	25.6 (22.5–28)	27.0 (4.9)	26.8 (23.3–29.2)	0.259	–	–
Sex (male)	158 (79%)	–	17 (85%)	–	0.773	–	–
HLA-B27*	181 (90.5%)	–	16 (80%)	–	0.140	–	–
Uveitis†	70 (35.5%)	–	6 (30%)	–	0.806	–	–
IBD‡	13 (6.6%)	–	2 (10%)	–	0.634	–	–
ASDAS-CRP	4.0 (0.8)	4.0 (3.4–4.6)	4.2 (1.1)	4.2 (3.2–4.8)	0.516	1.37 (0.80 to 2.32)	1.42 (0.81 to 2.49)
BASDAI	6.4 (1.5)	6.6 (5.3–7.4)	6.6 (1.5)	6.6 (5.7–7.8)	0.545	1.10 (0.81 to 1.49)	1.12 (0.81 to 1.55)
Patient global (0–10 scale)	6.7 (1.7)	6.8 (5.7–7.9)	6.6 (2.5)	7.4 (5–8.2)	0.792	0.97 (0.75 to 1.25)	0.97 (0.76 to 1.25)
CRP (mg/l)	22.4 (24.5)	15 (7–30)	33.1 (45.2)	20 (8.3–34.5)	0.330	1.01 (1.00 to 1.02)	1.01 (1.00 to 1.03)
SJC	1.6 (3.5)	0 (0–1)	2.4 (3.9)	1 (0–3.5)	0.025	1.05 (0.95 to 1.17)	1.06 (0.95 to 1.19)
Mander enthesitis index	11.9 (13.4)	8 (2–15)	8.8 (6.5)	8.5 (4–14.3)	0.883	0.98 (0.93 to 1.02)	0.98 (0.93 to 1.02)
BASFI	5.7 (1.9)	5.7 (4.4–7)	6.1 (1.9)	6.1 (4.9–8)	0.384	1.11 (0.87 to 1.41)	1.12 (0.86 to 1.46)
SF-36 Physical	29.8 (7.1)	29.1 (24.6–34.2)	28 (8.3)	30.6 (19.6–34.6)	0.486	0.96 (0.90 to 1.03)	0.96 (0.89 to 1.03)
SF-36 Mental	45.4 (10.9)	46.7 (36.9–53.6)	44.4 (10.3)	45.8 (34.3–52.9)	0.645	0.99 (0.95 to 1.04)	0.99 (0.95 to 1.04)
Chest expansion (cm)	3.4 (2)	3 (2–4)	4 (2.3)	4 (1.6–5.9)	0.228	1.16 (0.95 to 1.42)	1.22 (0.98 to 1.53)
Tragus to wall (cm)	17.2 (6.6)	15.5 (12–20.4)	16.6 (5.8)	15.3 (11.6–19.9)	0.743	0.99 (0.91 to 1.06)	0.96 (0.88 to 1.04)
Modified schober (cm)	2.5 (1.5)	2.5 (1–3.5)	2.5 (1.4)	2.1 (1–4)	0.868	1.02 (0.74 to 1.39)	1.01 (0.73 to 1.40)
Cervical rotation (cm)	45.9 (21.9)	45 (30–60)	47.6 (23.9)	51.5 (27.8–67.5)	0.762	1.00 (0.98 to 1.03)	1.01 (0.98 to 1.03)
Lateral spinal flexion (cm)	9.2 (5.2)	8.5 (5.5–12.5)	9.1 (6.5)	9.3 (3.25–13)	0.829	1.00 (0.92 to 1.09)	1.01 (0.92 to 1.11)
Intermalleolar distance (cm)	97.2 (27)	100 (78.3–114)	104.1 (26.4)	107 (96.3–122.3)	0.238	1.01 (0.99 to 1.03)	1.01 (1.00 to 1.03)
BASMI-2	4.3 (2.1)	4 (3–6)	4.1 (2.2)	4 (2–6.8)	0.736	0.96 (0.77 to 1.19)	0.90 (0.71 to 1.15)
BASMI-10	4.7 (1.6)	4.6 (3.4–5.8)	4.5 (1.6)	4.5 (3–6.2)	0.620	0.92 (0.69 to 1.23)	0.86 (0.63 to 1.18)
BASMI-linear	4.8 (1.6)	4.7 (3.6–5.9)	4.6 (1.6)	4.5 (3–6.1)	0.616	0.93 (0.69 to 1.24)	0.86 (0.62 to 1.18)
mSASSS total	18.6 (17.4)	13.5 (5–29)	24.2 (25)	14.3 (2.6–43.4)	0.785	1.02 (0.99 to 1.04)	1.01 (0.99 to 1.04)
mSASSS cervical	11.7 (10.9)	7.7 (3–19)	14.1 (14.5)	6.1 (2.1–31)	0.934	1.02 (0.98 to 1.06)	1.02 (0.97 to 1.06)

Variable	No psoriasis (N=191–201)*		Psoriasis (N=20)				
	Mean (SD) or number (%)	**Median (IQR)**	**Mean (SD) or number (%)**	**Median (IQR)**	**p Value† (psoriasis vs no psoriasis)**	**OR (95% CI)‡**	**Adjusted OR (95% CI)§**
mSASSS lumbar	6.9 (9.7)	2.5 (0.5–8.5)	10.1 (12.6)	3.3 (0.1–16)	0.586	1.03 (0.99 to 1.07)	1.02 (0.98 to 1.07)
ASspiMRI-a	6.1 (6.7)	4.5 (0.5–9.5)	7.8 (6.7)	5.6 (2.3–14.1)	0.188	1.03 (0.97 to 1.10)	1.02 (0.96 to 1.09)

*N=201 for all demographic variables, 200 for HLA-B27, 197 for uveitis, 198 for IBD, 200 for all other clinical and laboratory variables, 191 for mSASSS, 198 for ASspiMRI-a and 196 for ASspiMRI-c.
†Mann–Whitney U test for continuous variables and Fisher's exact test for nominal variables.
‡OR of the variable of interest (first column) for the presence of psoriasis (vs no psoriasis) in univariable logistic regression analysis.
§OR of the variable of interest (first column) for the presence of psoriasis (vs no psoriasis) in multivariable logistic regression analysis adjusted for age, gender, BMI, disease duration and HLA-B27 status.
ASDAS, ankylosing spondylitis disease activity score; ASspiMRI-a, ankylosing spondylitis spine MRI score for activity; BASDAI, Bath ankylosing spondylitis disease activity index; BASFI, Bath ankylosing spondylitis functional index; BASMI, Bath ankylosing spondylitis metrology index; BMI, body mass index; CRP, C-reactive protein; HLA, human leucocyte antigen; IBD, inflammatory bowel disease; mSASSS, modified Stoke ankylosing spondylitis spine score; SF-36, 36-item short for health survey; SJC, swollen joint count.

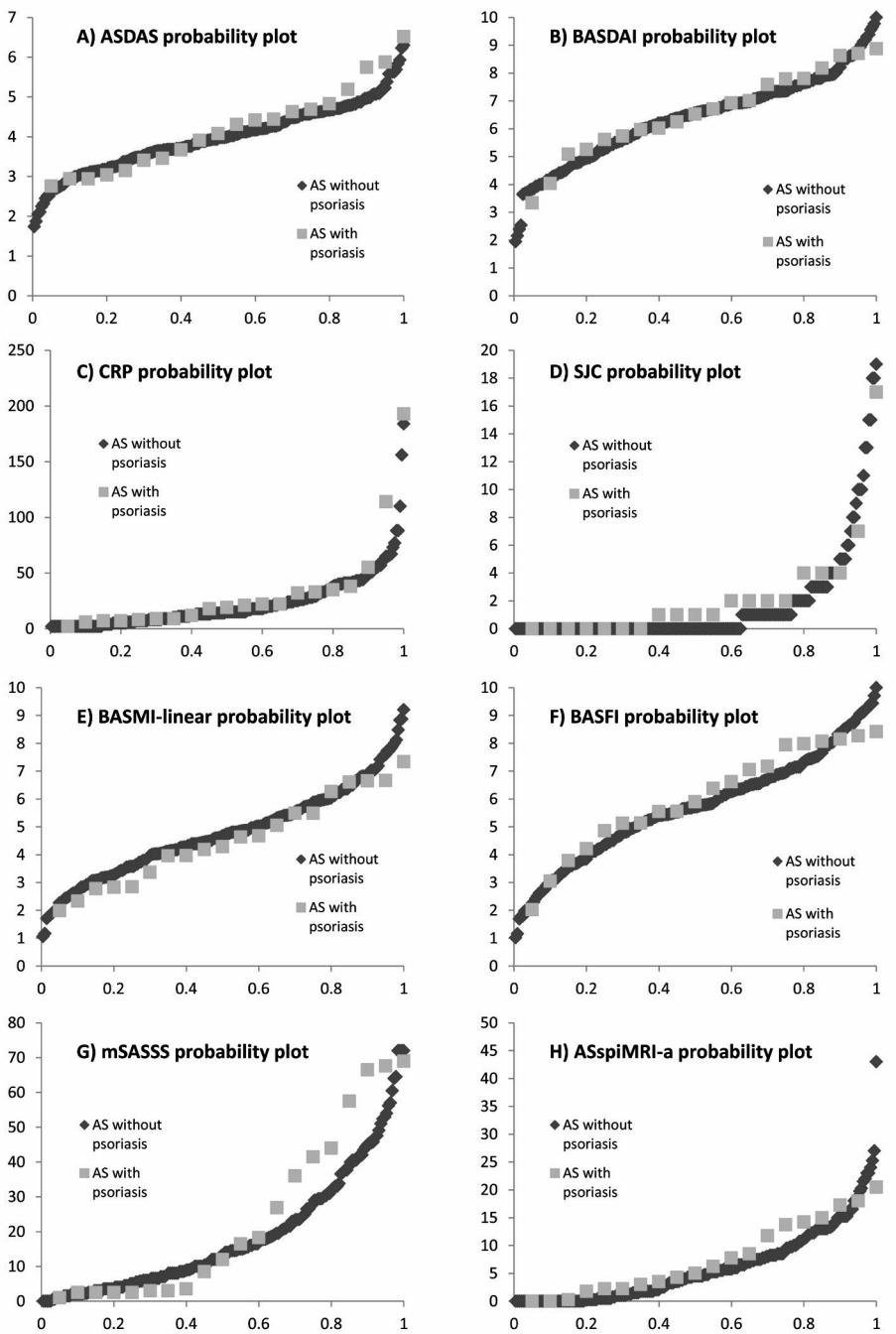

Figure 1. Probability plots for (A) ASDAS, (B) BASDAI, (C) CRP, (D) SJC, (E) BASMI-linear, (F) BASFI, (G) mSASSS and (H) ASspiMRI-a, stratified for AS patients with and without psoriasis. The y-axis represents the score of the outcome measure and the x-axis represents the cumulative probability. AS, ankylosing spondylitis; ASDAS, ankylosing spondylitis disease activity score; ASspiMRI-a, ankylosing spondylitis spine MRI score for activity; BASDAI, Bath ankylosing spondylitis disease activity index; BASFI, Bath ankylosing spondylitis functional index; BASMI, Bath ankylosing spondylitis metrology index; CRP, C-reactive protein; mSASSS, modified Stoke ankylosing spondylitis spine score; SJC, swollen joint count.

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