

of spinal degenerative MRI signs on X-rays (yes or no) and MRI (presence of Modic abnormalities, Pfirrmann score, Canal stenosis, Extrusion, High intensity zone Facet osteoarthritis) according to central reading (two readers) and axSpA diagnostic confidence (according to local clinician's confidence on a 0–10 visual analog scale) were assessed by univariate analysis using the chi-square test (or Fisher's exact test where appropriate) and the Mann-Whitney test. Adjustment for multiple testing was performed according to Bonferroni method.

Results: Of 708 patients, data were available for 677, 675 and 672 for SHA, LSA and TLA, measures with a mean value of 39.2°, 14.5° and 51.5° respectively. Clinical features and diagnostic confidence did not differ between the SHA, LSA and TLA groups. More sacroiliitis imaging, according to ASAS (41.4% versus 32.0%) and MORPHO definition (48.6% versus 39.3%), were reported in TLA <50° group but the differences did not reach statistical significance. Radiological scores were low with a mean value of 0.49 (±1.83), 0.30 (±0.78) and 4.9 (±9.0) for mSASSS, BASRI-total and SPARCC score, respectively, and no inter-group difference was found. In L5S1, more grade 3 and 4 Pfirrmann class and MODIC discopathy (types 1 and 2) were observed for SHA <40°, and TLA <50° ($p < 0.001$) whereas the difference did not reach the significance level for LSA <15° ($p = 0.05$) (table).

Level	L5/S1					
	SHA		LSA		TLA	
Angles	<40	>40	<15	>15	<50	>50
Number of patients	328	300	313	313	270	353
Pfirrmann class =3	99 (30.2)	53 (17.7) **	92 (29.3)	58 (18.5)*	83 (30.7)	68 (19.3) **
High Intensity Zone	61 (18.6)	35 (11.7)*	60 (19.2)	36 (11.5)*	40 (14.8)	56 (15.9)
Disc protrusion	37 (11.3)	22 (7.3)	27 (8.6)	30 (9.6)	34 (12.6)	24 (6.8)*
Disc extrusion	29 (8.8)	17 (5.7)	28 (8.9)	18 (5.8)	24 (8.9)	22 (6.2)
Canal stenosis	8 (2.4)	2 (0.7)	2 (0.7)	7 (2.2)	7 (2.6)	3 (0.8)
MODIC 1 signal	12 (3.7)	5 (1.7)*	15 (4.8)	2 (0.6)*	13 (4.8)	4 (1.1)*
MODIC 2 signal	7 (2.1)	1 (0.3)*	2 (0.6)	1 (0.3)*	5 (1.8)	3 (0.4)*
Facet joint osteoarthritis	1 (0.3)	2 (0.7)	1 (0.3)	2 (0.6)	1 (0.4)	2 (0.6)

Conclusions: Lumbar spine morphology is not associated with any clinical variable, presence on X-Rays or MRI of spinal signs of spondyloarthritis or sacroiliitis. At the L5S1 level, a more horizontal SHA and a reduction of TLA is associated with more degenerative radiological lumbar spine manifestations.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.5128

FRI0466 REAL-LIFE PERFORMANCE OF THE ASAS HEALTH INDEX IN ROUTINE CARE OF PATIENTS WITH SPONDYLOARTHRITIS

U. Kiltz, T. Wiatr, X. Baraliakos, K. Fedorov, J. Braun. *Rheumatology, Rheumazentrum Ruhrgebiet, Herne, Germany*

Background: The measurement properties of the ASAS Health Index (ASAS HI) which has been developed to measure health and functioning of patients with spondyloarthritis (SpA) have been evaluated in a cohort study. Its association with structural changes has not been examined to date.

Objectives: To investigate the relationship between clinical data, function and health as assessed by the ASAS HI in patients with axial SpA (axSpA) and to study the influence of structural spinal changes on this instrument.

Methods: Patients fulfilling ASAS classification criteria for axSpA were recruited prospectively. Information was collected on clinical assessments (ASAS HI, NRS pain, BASDAI, ASDAS, BASFI, BASMI), laboratory parameters and spinal x-rays. Images were scored using mSASSS by two independent readers. The relationship between ASAS HI and other health outcomes was evaluated by Spearman correlation.

Results: A total of 150 patients (57 nr-axSpA and 93 AS patients) were included: 68.7% male, mean (SD) age 46.4 (14.1), symptom duration 18.7 (13.5) and diagnosis since 11.4 (11.8) years, and HLA-B27 positive in 82.0%. Values of clinical assessments were ASAS HI 7.4 (4.1), BASDAI 4.7 (2.3), ASDAS 2.7 (1.1), BASMI 3.3 (1.8), pain 5.7 (2.7), and BASFI 4.7 (2.6). Elevated CRP levels were found in 34.8% of the patients. Radiographs of the sacroiliac (SI) joint and the spine were available in 138 patients, 38.0% of which had syndesmophytes and 7.5% had a bamboo spine. The median (IQR) mSASSS value was 4.3 (IQR 1.0–22.1) in AS and 0.2 (IQR 0.0–1.4) in nr-axSpA patients. Patients received a treatment with NSAIDs (62.7%), DMARDs (20.9%) and/or biologics (49.4%). Significant correlation of ASAS HI was found for BASFI ($r = 0.8$), BASDAI

($r = 0.7$), ASDAS ($r = 0.5$) and BASMI ($r = 0.5$, and, all $p < 0.05$). No correlations were found for ASAS HI and radiographic damage (mSASSS $r = 0.2$, occurrence of syndesmophytes $r = 0.01$, occurrence of bamboo spine $r = 0.2$) and CRP levels ($r = 0.07$). Stratifying patients by symptom duration (cut-off 3 years) did not affect these results.

Conclusions: Established measures of function and spinal mobility correlate well with the ASAS HI in patients with axSpA. The influence of structural changes as measured by mSASSS on the ASAS HI was limited in this study, probably due to relatively low mSASSS scores at baseline. Further study in more and more severe patients is needed to study the association of physical activity, spinal mobility, function and radiographic damage in axSpA.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.2202

FRI0467 DEVELOPMENT AND PRELIMINARY VALIDATION OF THE COMPUTED TOMOGRAPHY SACROILIAC STRUCTURAL SCORE (CT-SSS) FOR ASSESSMENT OF STRUCTURAL LESIONS IN AXIAL SPONDYLOARTHRITIS

W.P. Maksymowich^{1,2}, M. Raynal³, D. Loeuille³, M.-A. D'Agostino⁴, J. Paschke², R.G. Lambert⁵. ¹Medicine, University of Alberta; ²CaRE Arthritis, Edmonton, Canada; ³Rheumatology, CHRU de Nancy, Vandœuvre-lès-Nancy; ⁴Rheumatology, Université Paris Ouest, Paris, France; ⁵Radiology, University of Alberta, Edmonton, Canada

Background: Computed tomography (CT) is considered the imaging benchmark for the assessment of certain structural lesions in the sacroiliac joints (SIJ) of patients with axial spondyloarthritis (axSpA). Availability of low dose radiation techniques may lead to more widespread use, potentially as a structural endpoint in clinical trials research.

Objectives: We aimed to validate a new CT-based scoring method, the CT Sacroiliac Structural Score (CT-SSS), for assessing structural lesions in the SIJ.

Methods: CT scans of the SIJ from 44 patients (26 females, mean age 49.4 years, mean symptom duration 9.1 years) were reconstructed in the semicoronal plane parallel to the superior border of the sacrum and scoring of lesions was confined to this plane. Structural lesions were scored in consecutive slices in SIJ quadrants (erosion, sclerosis) or SIJ halves (ankylosis) on a dichotomous basis (present/absent) using the same anatomical principles as developed for the SPARCC MRI SIJ inflammation and structural scores. The most anterior slice is defined as visible joint ≥ 1 cm vertical height and when < 3 cm is defined as having only upper iliac and sacral quadrants. A visible joint ≥ 3 cm vertical height is defined as having 4 quadrants. At the posterior aspect of the SIJ, there is a natural separation of iliac and sacral cortical bone by structures in the ligamentary portion. Scoring is terminated when < 1 cm of iliac and sacral bone is appositional. Two readers independently scored CT scans without a prior calibration exercise and using direct online data entry onto a schematic of the SIJ. Reliability was assessed by kappa statistics, intra-class correlation coefficient (ICC), and Bland-Altman limits of agreement.

Results: Scoring was feasible (5–10 minutes per scan) and both ankylosis (ICC=0.95) and erosion (ICC=0.81) were reliably scored (Table). Sclerosis was less reliably scored (ICC=0.39). Presence/absence of ankylosis was reliably detected irrespective of whether this was based on a single slice ($\kappa = 0.77$) or 3 consecutive slices ($\kappa = 0.81$). Reliable detection was lower for erosion ($\kappa = 0.50$ for 1 or 3 slices) and sclerosis ($\kappa = 0.44$ and 0.48 for 1 and 3 slices, respectively). Bland-Altman graphs illustrate reliability across the range of scores for ankylosis and erosion.

Table 1. Descriptive and Reliability data for CT-SSS score

	Mean (SD) score		Median (IQR) score		ICC	95% L of A
	R1	R2	R1	R2		
Erosion	4.4 (9.7)	6.5 (11.5)	0 (25.5)	0 (21)	0.95	-10.7, 13.5
Ankylosis	7.5 (14.1)	6 (13.6)	0 (12)	0 (12)	0.81	-16.2, 12.2
Sclerosis	6.6 (14.4)	7.4 (18.2)	0 (20)	0 (24.5)	0.39	-34.5, 33.0

IQR interquartile range L of A Limits of Agreement.

Conclusions: The CT-SSS method is feasible and reliable for scoring ankylosis and erosion with minimal calibration. Sclerosis requires further standardization and calibration.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.5254

FRI0468 RADIOGRAPHIC HIP INVOLVEMENT IN PATIENTS WITH ANKYLOSING SPONDYLITIS. A STUDY OF ITS PREVALENCE AND DETERMINING FACTORS

X. Michelena, M. López de Recalde, H. Borrell, J. Lluch, P. Juárez, I. Morales, M. Pascual, J.-M. Nolla, X. Juanola. *Department of Rheumatology, Hospital Universitari de Bellvitge, L'Hospitalet de Llobregat, Barcelona, Spain*

Background: Hip involvement in Ankylosing Spondylitis (AS) is the most frequent extraspinal manifestation and a common cause of disability and limited mobility, often ending with hip replacement. There are few studies analysing the radiographic changes of the hip and their relationship with other disease variables.

Objectives: To determine the factors associated with radiographic hip involvement and its prevalence.

Methods: A cross-sectional study was performed based on patients with AS, excluding the patients with associated psoriasis or inflammatory bowel disease. To assess radiographic hip involvement, we scored the last anteroposterior pelvic radiograph performed using the *Bath Ankylosing Spondylitis Radiology Index* (BASRI). Demographic, clinical, laboratory and radiographic data were collected and analysed. We considered the presence of hip disease with a BASRI-hip grade of at least 2. Statistical analysis: A descriptive study was performed. To compare differences we used a 1-way ANOVA test and Pearson chi-square. The statistical analyses were done using SPSS 24.0. $p \leq 0.05$ was considered statistically significant.

Results: 215 patients were identified, with a mean age of 52 ± 13.6 years and 76.7% of the patients were male. The age at onset was 25.29 ± 8.22 years. 86.4% of the patients were HLA-B27-positive. Regarding their treatment, 27.9% were under biological therapy. A hip replacement was needed in 14 patients (0.7%), with 6 of them requiring a bilateral hip replacement. The mean BASDAI score, BASFI score and ASDAS CRP index were 4.01 ± 6.31 ; 4.73 ± 8.8 and 2.17 ± 1.01 respectively.

The table shows the comparison between the two groups based on the presence of hip involvement (BASRI hip ≥ 2). Statistically significant differences were observed in the age, age at onset and presence of peripheral arthritis. Patients with hip involvement had higher scores in BASFI score, ASDAS CRP and ESR. Axial radiographic involvement assessed with axial BASRI score and total SASSSm was associated with hip disease and a significant association was seen between hip involvement and metrological parameters.

	No hip disease n=154 (71.6%)	Hip disease n=61 (29.4%)	P-value
Age* (years)	49.5 \pm 13.63	58.16 \pm 11.53	<0.001
Age at onset* (years)	26.14 \pm 8.4	23.16 \pm 7.38	0.017
Male sex, n (%)	113 (73.4)	52 (85.2)	0.063
HLA-B27+, n (%)	132 (85.7)	52 (85.2)	0.790
Peripheral arthritis, n (%)	33 (21.4)	25 (41.0)	0.004
Uveitis, n (%)	40 (26.0)	13 (21.3)	0.475
Biological treatment, n (%)	41 (27.0)	19 (31.1)	0.54
BASDAI*	3.84 \pm 7.29	4.47 \pm 2.14	0.527
BASFI*	3.79 \pm 7.15	7.23 \pm 11.81	0.012
ASDAS CRP*	2.07 \pm 1.01	2.45 \pm 0.95	0.014
ASDAS ESR*	1.89 \pm 0.90	2.52 \pm 1.92	0.002
Schober's index* (cm)	3.61 \pm 1.55	2.43 \pm 1.69	<0.001
Chest expansion* (cm)	4.97 \pm 1.84	3.67 \pm 2.02	<0.001
Cervical rotation* (cm)	72.03 \pm 19.73	49.18 \pm 28.01	<0.001
Lateral flexion* (cm)	12.96 \pm 5.18	7.85 \pm 4.1	<0.001
Occiput to wall distance* (cm)	2.49 \pm 4.36	8.45 \pm 8.38	<0.001
Intermalleolar* (cm)	100.22 \pm 21.22	82.37 \pm 17.91	<0.001
Axial BASRI*	5.31 \pm 3.10	8.53 \pm 3.38	<0.001
Total SASSSm*	10.24 \pm 16.07	30.67 \pm 27.31	<0.001

*Mean \pm SD.

Conclusions: Radiographic hip involvement assessed with BASRI score is prevalent and it is related with the age at onset, disease activity and the presence of peripheral arthritis. These patients present more disability, less mobility and greater axial radiographic involvement.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.4375

FRI0469 DIFFERENCES BETWEEN ANKYLOSING SPONDYLITIS PATIENTS WITH AND WITHOUT RADIOGRAPHIC HIP INVOLVEMENT IN CHINA

X. Zheng, Q. Wei, J. Gu. *Department of Rheumatology and Immunology, The Third Affiliated Hospital of Sun Yat-sen University, Guangzhou, China*

Background: Hip involvement, defined by clinical examination or imaging techniques, is a problem of great concern in Ankylosing Spondylitis (AS) patients as it leads to functional impairment and poor outcomes. It has been shown that early age at disease onset, peripheral manifestation and severe axial disease are risk factors, but other characteristics do not show consistency through studies and data is scarce so far.

Objectives: We aim to describe the phenotype differences between AS patients with and without radiographic hip involvement and to identify potential risk factors for hip involvement.

Methods: AS patients fulfilling the Modified New York Criteria and whose pelvic X-rays have been assessed by at least one radiologist and one rheumatologist were included. Radiographic hip involvement was defined by features of osteophytes around the femoral neck, erosions of the acetabulum, axial migration of the femoral head or hip joint space narrowing. The medical records were retrospectively reviewed and collected. Demographic and disease characteristics were compared by descriptive and bivariate statistics using SPSS v19.0 and stata v12.1 package.

Results: Totally 261 AS patients with hip involvement and 429 patients without hip involvement were analyzed. Statistical significance were found between these 2 groups regarding age at disease onset, gender, BMI, disease duration and presence of peripheral arthritis, with all p value ≤ 0.001 . Male patients showed strong risk effect on hip involvement with the odds ratio (OR) around 3.27.

Meanwhile, the hip-involved group had lower body mass index (BMI), which may relate to long disease duration or high inflammation level. No significant difference of HLA-B27 positivity, family history and other factors were observed (Table 01). Binary logistic regression results showed that age at disease onset, gender, BMI and disease duration were associated with hip involvement in AS ($p < 0.001$). As for the symptoms, among 69 hip-involved and 75 non-involved AS with corresponding records, 83% hip-involved and 35% non-hip-involved patients complained of typical inguinal pain (OR=8.95, 95% CI=3.85~21.37, $p < 0.001$).

Table 1

	AS with hip involvement (n=261)	AS without hip involvement (n=429)	p value
Age, m (SD)	28.57 (8.66)	28.01 (8.53)	0.41
Age at disease onset, m (SD)	18.28 (5.74)	22.31 (6.87)	<0.001
Men, n (%)	240 (91.95)	336 (77.78)	<0.001
BMI, m (SD)	20.35 (3.47)	21.31 (3.30)	<0.001
Disease duration, median (interquartile range)	108.00 (120.00)	48.00 (72.00)	<0.001
HLA-B27 positive, n (%)	230 (90.20)	370 (88.94)	0.61
Family history positive, n (%)	72 (27.80)	100 (23.53)	0.22
Inflammatory low back pain, n (%)	235 (90.38)	381 (88.81)	0.52
Peripheral arthritis, n (%)	118 (45.21)	140 (32.86)	0.001
Dactylitis, n (%)	9 (3.45)	9 (2.10)	0.28
Uveitis, n (%)	28 (10.73)	48 (11.21)	0.84
Enthesitis, n (%)	56 (21.62)	89 (21.04)	0.86
Axial pattern, n (%)	132 (50.57)	249 (58.04)	0.056

Conclusions: Compared to AS patients without hip involvement, the radiographic hip-involved group are younger age at disease onset, more frequently men and complaining of typical inguinal pain, have lower BMI and longer disease duration. AS patients having these concomitant risk factors should undergo further hip assessment in clinical practice.

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Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2017-eular.4159

FRI0470 CIGARETTE SMOKING HAS A DOSE-DEPENDENT RELATIONSHIP WITH DISEASE ACTIVITY AND CORRELATES WITH MORE FUNCTIONAL LIMITATION AND WORSE HEALTH ASSESSMENT IN THE PATIENTS WITH ANKYLOSING SPONDYLITIS

Y. Jiang, Z. Liao, Z. Lin, M. Yang, Y. Zhang, Q. Li, J. Gu. *Rheumatology, The Third Affiliated Hospital of Sun Yat-sen University, Guangzhou, China*

Background: Ankylosing spondylitis (AS) is a chronic inflammatory disease that mainly affects the axial skeleton by causing inflammatory and osteoproliferative changes in the sacroiliac joints and spinal structures [1]. Cigarette smoking is associated with poor outcome in patients with established and early AS [2].

Objectives: Our study was to investigate the relationship between cigarette smoking and pain, disease activity, functional limitation, and health assessment in Chinese patients with AS.

Methods: Patients with AS (n=683) from China took part in a cross-sectional survey. Smoking status was obtained by a standardized questionnaire, involving smoking status (non-smokers, exsmokers, current smokers), the age when starting smoking, cigarette numbers a day and smoking status of family numbers. The Bath AS Disease Activity Index (BASDAI), the Bath AS Functional Index (BASFI), visual Analogue scale of pain, Health Assessment Questionnaire for Spondyloarthropathy (HAQ-S) were analyzed in terms of smoking status and relationship with pack-year history.

Table 1. Demographic features and clinical and laboratory results of the patients with AS and comparison between patients with different smoking status

Variable	All patients N=683	Non-smokers N=407	Ex-smokers N=108	Current smokers N=168	P(1:3)	P(2:3)	P(1:2)
Age (years)	27.33 \pm 8.67	26.04 \pm 8.65	27.65 \pm 8.74	30.24 \pm 7.98	0.000	0.001	0.069
Disease duration (years)	6.47 \pm 6.47	5.73 \pm 6.08	6.81 \pm 6.54	8.05 \pm 7.05	0.000	0.094	0.071
Morning stiffness (VAS)	3.12 \pm 2.86	2.84 \pm 2.87	2.87 \pm 2.53	3.96 \pm 2.89	0.000	0.003	0.739
Overall Pain (VAS)	3.97 \pm 2.77	3.78 \pm 2.83	3.96 \pm 2.70	4.44 \pm 2.61	0.005	0.150	0.440
Nocturnal back pain (VAS)	2.93 \pm 2.96	2.63 \pm 2.90	2.89 \pm 2.73	3.68 \pm 3.11	0.000	0.049	0.216
ESR (mm/h)	20.94 \pm 21.71	20.80 \pm 22.61	19.65 \pm 20.92	22.11 \pm 19.98	0.311	0.150	0.407
CRP (mg/dl)	18.4 \pm 26.01	17.33 \pm 28.14	18.4 \pm 22.76	20.98 \pm 22.26	0.001	0.126	0.340
BASDAI	3.36 \pm 2.03	3.21 \pm 2.05	3.30 \pm 1.79	3.76 \pm 2.07	0.002	0.065	0.437
BASFI	5.21 \pm 9.21	1.47 \pm 2.07	1.54 \pm 1.98	1.55 \pm 1.63	0.018	0.379	0.251
HAQ	0.21 \pm 0.33	0.20 \pm 0.33	0.19 \pm 0.30	0.23 \pm 0.33	0.130	0.313	0.213

P(1:3) refers to p value of The Mann-Whitney U test and t test between non-smokers and current smokers.