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More or less imaging in axial SpA?

OP0114   LOW DOSE COMPUTED TOMOGRAPHY DETECTS MORE
PROGRESSION OF BONE FORMATION IN COMPARISON TO
CONVENTIONAL RADIOGRAPHY IN PATIENTS WITH
ANKYLOSING SPONDYLITIS: RESULTS FROM THE SIAS
COHORT

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Background: Recently we presented the good interreader reliability and sensitivity to detect changes with a newly developed scoring method of bone formation on low dose computed tomography (LD-CT) of the whole spine in patients (pts) with Ankylosing Spondylitis (AS)[1]. Next step in the validation is the comparison with conventional radiographs (CR).

Objectives: To compare the assessment of syndesmophyte formation and growth on CR and LD-CT in pts with AS.

Methods: Pts from the SIAS (Sensitive Imaging of Axial Spondyloarthritis) cohort from Leiden and Herne were analysed. Inclusion criteria were modified NY criteria, ≥ 1 syndesmophytes on either the cervical and/or lumbar spine on CR, and ≥ 1 inflammatory lesion on MRI-spine. Pts had CR of the lateral cervical and lumbar spine and LD-CT (approximately 2–3mSV) of the entire spine at baseline and two years. Two readers independently assessed both CR and CT in separate sessions. Images were paired per patient, blinded to time order, patient information, and result of the other imaging technique. CR was assessed using the mSASSS scoring method. On CT, syndesmophytes were scored in the coronal and sagittal planes for all "corners" per view, thus scoring 8 "corners" per vertebral unit. Syndesmophytes were scored as absent (score 0), <50% of the intervertebral disc height (IVDH) (score 1), $\geq 50\%$ of the IVDH but no bridging (score 2) or as bridging the IVDH (score 3)[1]. The formation of new syndesmophytes (CR score 0 or $1\rightarrow 2$ or 3, CT $0\rightarrow 1$ or 2 or 3) and growth of existing syndesmophytes (CR score $2\rightarrow 3$, CT $1\rightarrow 2$ or 3, or $2\rightarrow 3$) and the combination of both was calculated per vertebral corner. Consensus about each of these outcomes was defined by agreement of both readers on the same vertebral level. Data of CR and CT was compared per reader and for the consensus score.

Results: 50 patients (mean age 48.6 years; 84% male; 80% HLA-B27) were included in the analysis. The number (%) of pts with newly formed, growth or combined newly formed and growth of syndesmophytes for separate readers and consensus score are presented in table 1. In all comparisons, CT detected more patients with progression. This is especially apparent in case of growth and for cut-offs of a higher number of (newly formed or growth of) syndesmophytes per patient. E.g. with the strictest comparison of the consensus score for both CR and CT, 30% of the patients show bony proliferation (newly formed and growth) at ≥ 3 sites on CT compared with only 6% on CR.

Table 1. Comparison of CR and CT per reader and consensus* for the formation and/or growth of syndesmophytes in 50 patients with ankylosing spondylitis.

New syndesmophytes	Reader 1		Reader 2		Consensus	
	CR	CT	CR	CT	CR	CT
≥ 1	27 (54)	43 (86)	30 (60)	44 (88)	19 (38)	21 (42)
≥ 2	14 (28)	38 (76)	14 (28)	41 (82)	7 (14)	15 (30)
≥ 3	6 (12)	32 (64)	8 (16)	30 (60)	2 (4)	10 (20)
Growth of syndesmophytes						
≥ 1	10 (20)	35 (70)	7 (14)	32 (64)	3 (6)	16 (32)
≥ 2	8 (16)	36 (52)	6 (12)	27 (54)	3 (6)	11 (22)
≥ 3	2 (4)	23 (46)	4 (8)	18 (36)	1 (2)	6 (12)
New syndesmophytes or growth of syndesmophytes						
≥ 1	28 (56)	45 (90)	33 (66)	48 (96)	21 (42)	25 (50)
≥ 2	18 (36)	42 (82)	19 (38)	44 (88)	9 (18)	20 (40)
≥ 3	12 (24)	36 (72)	12 (24)	38 (76)	3 (6)	15 (30)

Results are presented as the number (%) of patients with ≥ 1, ≥ 2 and ≥ 3 newly formed syndesmophytes and syndesmophytes that grew, as well as for the combination of new formation and growth.
*Both readers agree about the formation or growth of a syndesmophyte at the same vertebral corner.
CR: conventional radiography, CT: computed tomography

Conclusions: LD-CT covering the whole spine, is a more sensitive method for assessing the formation and growth of syndesmophytes than CR which is limited to cervical and lumbar spine in pts with AS and is a promising method of assessment for clinical research.

References:
[1] de Bruin F et al. A&R 2016; 68 (suppl 10).

Disclosure of Interest: None declared

OP0115   EVALUATION OF THE CHANGES IN STRUCTURAL DAMAGE IN
AXIAL SPONDYLOARTHRITIS ON PLAIN PELVIC
RADIOGRAPHS: THE 5 YEARS DATA OF THE DESIR COHORT

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Background: The structural damage of axial spondyloarthritis can be evaluated either at the spine or at the Sacroiliac Joint (SIJ) level and by using either plain X-Rays or MRI. So far, the evaluation of the changes in structural damage at the SIJ level has referred mainly to plain X-Rays and to a binary variable (e.g. fulfillment of the modified New York (mNY) criteria yes/no).

Objectives: To evaluate the reliability and the sensitivity to change of different outcome measures of SIJ structural damage observed at pelvic X-Rays.

Methods: *Study design:* Prospective longitudinal (5 years) follow-up of patients with recent onset (≤ 3 years) axial SpA (according to the treating rheumatologist) enrolled in the DESIR cohort. *Data collected:* Pelvic X-Rays at baseline and after 2 and 5 years of follow-up. *Reading procedure:* The films were evaluated by 3 trained readers unaware of their chronology according to the 0–4 mNY grading scale (from 0 = normal to 4 = fusion) for each SIJ (left and right). *Outcome measures:* One continuous variable: change in the total score (from 0 to 8) and 3 dichotomous variables: A/ Switch from non-radiographic (nr) to radiographic (r) axial SpA according to the mNY definition (e.g. at least unilateral grade III or bilateral grade II), B/ Change of at least one grade in at least one SIJ C/ Change of at least one grade in at least one SIJ and an absolute final value of the worsened joint of at least 2. *Statistical analysis:* a) inter-reader reliability of the changes in the outcome measures (intra-class correlation coefficient for the continuous outcome and Kappa statistics for the dichotomous outcomes) b) sensitivity to change by evaluating the % of net progressors (e.g. worsened minus improved) on both the completer population and the patients with at least one post baseline radiological evaluation using different missing data handling technics (Last Observation Carried Forward, Linear Extrapolation).

Results: The number of patients with available readings from all 3 readers were: 416 (baseline and 5 years), 378 (all time points) and 557 (baseline and at least one post baseline). The results were similar whatever the technic of data missing handling.

In the completer population, (a) The inter-reader reliability was low to modest: 0.21 (0.15–0.28) for the continuous variable and 0.23 (0.10–0.41), 0.24 (0.16–0.34) and 0.23 (0.13–0.35) for the dichotomous variables A, B and C, respectively.
(b) The changes in the total continuous score (from 1.41 ± 1.68 to 1.60 ± 1.83) was modest but highly significant (e.g. 0. 19 ± 0.55 $p<0.0001$). The percentage of net progressors are summarized in the figure. These were 5.1%, 13.6% and 10.2% for the dichotomus variables A, B and C respectively.

Fig: changes in different binary SIJ-Plain X-Rays outcome measures
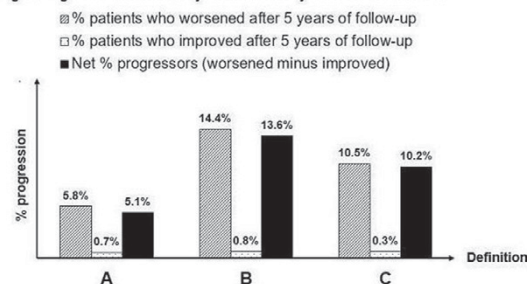
A = Switch from nr to r-axSpA according to the mNY criteria (worsened) *minus* switch from r to nr-axSpA
B = Change in at least one grade in at least one SIJ
C = Change in at least one grade in at least one SIJ and a final (at year 5) absolute value of at least 2 in the worsened joint (worsened) *minus* change in at least one grade in at least 1 SIJ and a baseline (year 0) absolute value of at least 2 in the improved joint

Conclusions: These data suggest that the structural progression at the SIJ level in recent onset SpA does exist but is modest. Different definitions of changes (e.g. at least one grade in at least one SIJ) seem to be more sensitive than the conventional definition (e.g. switch from nr to r) while reliability was similar. Therefore, these definitions might be useful to evaluate the natural history of the disease.

Disclosure of Interest: None declared

OP0116   SWITCH FROM NON-RADIOGRAPHIC TO RADIOGRAPHIC
AXIAL SPONDYLOARTHRITIS IS HIGHLY DEPENDENT OF
BASELINE OBJECTIVE SIGNS OF INFLAMMATION: 5 YEAR
DATA OF THE DESIR COHORT

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Background: The natural history (e.g. appearance of structural damage) of non-radiographic (nr) axial (ax) Spondyloarthritis (SpA) is not well known.

Objectives: To evaluate the switch from nr- to radiographic (r) status of recent onset axSpA after 5 years of follow-up and its predisposing factors.

Methods: *Patients:* Recent onset axial SpA (DESIR Cohort). *Outcome measure:* Radiographic SIJ status according to the mNY criteria after 5 years follow-up. *Reading of the SIJ-X-Rays:* 3 trained readers unaware of the chronology of the films. *Potential predisposing factors:* Demographics, smoking status, HLA-B27, Bone Marrow Edema (BME) at MRI of the SIJ, CRP, disease activity and