formation. Therefore, detecting abnormal osteoblast hyperactivity in the axial joints of patients with axSpA might be an attractive imaging modality to detect potential of spinal structural progression. Bone scintigraphy is used to evaluate the sites of active bone formation by detecting osteoblast activities and visualizing the whole skeleton at once. Therefore, bone scintigraphy is a theoretically ideal imaging modality to predict abnormal bone growth of axial joints in patients with axSpA.

Objectives: To investigate whether bone scintigraphy with semiquantitative analysis in patients with early axial spondyloarthritis (axSpA) has prognostic value for predicting spinal structural progression of these patients after 2 years.

Methods: The records of 53 patients with early axSpA who underwent baseline bone scintigraphy were reviewed retrospectively. The sacroiliac joint to sacrum (SIS) ratio of bone scintigraphy was measured for semiquantitative analysis, and modified Stoke Ankylosing Spondylitis Spinal Score (mSASSS) and syndesmophyte growth were calculated at baseline and after 2 years. Receiver operating characteristic (ROC) curve analysis was used to determine the cutoff for the SIS ratio of bone scintigraphy. To identify factors associated with significant spinal structural progression, univariate and multivariate logistic regression analyses were performed. Significant progression of spinal structural damage over 2 years was defined as an increase of mSASSS of at least 2 units for 2 years or new syndesmophyte growth/bridging of pre-existing syndesmophytes.

Results: Multivariate regression analysis revealed obesity ($P = 0.023$), current smoking status ($P = 0.012$), and high SIS ratio of bone scintigraphy ($P = 0.015$) as independent predictors for worsening mSASSS by at least 2 units over 2 years. For new syndesmophyte growth/bridging of pre-existing syndesmophytes over 2 years, current smoking ($P = 0.013$), high SIS ratio of bone scintigraphy ($P = 0.025$), and pre-existing syndesmophyte ($P = 0.036$) were independent predictors.

Conclusion: Semiquantitative analysis of bone scintigraphy (high SIS ratio) in patients with early axSpA may be useful for identifying patients at high risk for spinal structural progression after 2 years.

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Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.271

THU0533

A SINGLE MRI DIXON SEQUENCE TO ASSESS DISEASE ACTIVITY AND CARTILAGE IN EARLY RHEUMATOID HANDS: ONE SEQUENCE TO ASSESS THEM ALL?

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Background: OMERACT recommends three "core set" MRI sequences with an optional cartilage-dedicated sequence to perform Rheumatoid Arthritis (RA) MRI scoring (RAMRIS) (1). Dixon method allows the production of four different images from a single MRI sequence.

Objectives: To test a short MRI protocol based on a single Dixon sequence to assess disease activity and cartilage in hands of patients with early RA.

Methods: Twenty-four patients (16 women, mean age 45.7 years old) with early DMARD-naïve RA meeting the ACR/EULAR 2010 criteria were prospectively included. Both hands of each patient were imaged with MRI including contrast-enhanced T1-weighted Dixon and OMERACT "core set" MRI sequences and with conventional radiography.

Two musculoskeletal radiologists (R1 and R2) separately assessed disease activity according to RAMRIS scoring system based on the Dixon images (contrast-enhanced T1-weighted Dixon water-only images to score synovitis, tenosynovitis and osteitis and contrast-enhanced T1-weighted Dixon fat-only images to score erosions) and the three OMERACT "core set" MRI sequences (contrast-enhanced fat-saturated T1-weighted images to score synovitis and tenosynovitis, fat-saturated T2-weighted images to score osteitis and T1-weighted images without contrast-material injection to score erosions).

One radiologist (R1) separately measured the thickness of the cartilage in the joints corresponding to those assessed by the Sharp/van der Heijde modified scoring method on contrast-enhanced T1-weighted Dixon out-of-phase images and radiographs (2).

RAMRIS scoring and measurement of the cartilage thickness were repeated by R1 to assess intra-observer agreement. Statistical analysis was based on intra-class correlation coefficients (ICC) with 95% confidence interval to assess inter-technique, intra-observer and inter-observer agreement. The strength of agreement was interpreted as follows: ≤ 0 , poor; 0.01-0.20, slight; 0.21-0.40, fair; 0.41-0.60, moderate; 0.61-0.80, substantial and ≥ 0.81 , excellent.

Results: Agreement between total RAMRIS scores obtained with the Dixon water- and fat-only images and total RAMRIS scores obtained with the OMERACT sequences was excellent for R1 (0.94; 0.86-0.97) and R2 (0.91; 0.81-0.96). Intra-observer agreement was excellent with Dixon images (0.97; 0.92-0.98) and OMERACT sequences (0.96; 0.90-0.98). Inter-observer agreement was excellent with Dixon images (0.92; 0.82-0.96) and OMERACT sequences (0.93; 0.85-0.97).

Agreement between the measures of cartilage thickness on the Dixon out-of-phase images and the measures of cartilage thickness on radiographs was substantial (0.71; 0.66-0.75). Intra-observer agreement was excellent with Dixon out-of-phase images (0.94; 0.93-0.95) and radiographs (0.93; 0.92-0.94).

Conclusion: An MRI protocol based on a single contrast-enhanced T1-weighted Dixon sequence allows reproducible RAMRIS scoring and measurement of the cartilage thickness. Further studies should be performed to evaluate the value of a short MRI protocol based on the Dixon method to monitor disease activity including cartilage loss in treated RA patients.

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Disclosure of Interests: Thomas Kirchgesner: None declared, Maria Stoeniou: None declared, Nicolas Michoux: None declared, Patrick Durez Speakers bureau: AbbVie, Bristol-Myers Squibb, Celltrion, Eli Lilly, Pfizer, Sanofi, Bruno Vande Berg: None declared

DOI: 10.1136/annrheumdis-2020-eular.1685

THU0534

LUNG ULTRASOUND IN PATIENTS WITH SECONDARY INTERSTITIAL LUNG DISEASES

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Background: Currently, lung ultrasound (LUS) is increasingly used in rheumatology.

Objectives: To evaluate the relationship between lung ultrasound and pulmonary function and disease activity in patients with rheumatic diseases with secondary lung involvement.

Methods: Thirty patients with rheumatic diseases were included in the study, who, according to the data of the high-resolution RCT of lungs (64-slice CT system Philips Diamond Select Brilliance), showed interstitial lung involvement as a type of nonspecific interstitial pneumonia. In 4 patients, mixed connective tissue disease (MCTD) was diagnosed, 20 had systemic vasculitis (SV), and 6 had rheumatoid arthritis (RA). The mean age of the patients was 56.55 ± 10.59 , the duration of the disease was 2.3 ± 1.2 years. All patients underwent a standard clinical examination, the following indices and scales were used to assess the activity of the underlying disease: VDI damage index, Birmingham systemic vasculitis activity scale (BVAS), RA activity scale (DAS 28-CRP). The functional state of the lungs was assessed using spirometry, bodipletismography, gas diffusion "single breath". LUS was carried out for the evaluation of the location and number of B-lines on both right and left hemithoraces using commercially available echographic equipment with a 5-12 MHz linear transducer (Accuvix A30, Samsung Medison).

Results: Most patients had an average number of B-lines $24.5[11.5;34.0]$. There were no significant differences in the number of B-lines between groups of patients of different nosologies. The total number of B-lines correlated with the index of activity of systemic vasculitis BVAS ($p < 0.05$; $r = 0.83$). There were no statistically significant correlations with clinical manifestations of pulmonary involvement.

Conclusion: Lung ultrasound may be useful in screening secondary lung involvement in patients with rheumatic diseases with high activity.

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Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.5168

THU0535

ARE THERE DISCRIMINATING FEATURES BETWEEN "SCLERODERMA" AND "SCLERODERMA-LIKE" CAPILLAROSCOPIC PATTERN?

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Background: The "scleroderma" type capillaroscopic pattern is a diagnostic criterion of the EULAR/ACR scoring system for systemic sclerosis (SSc). In addition, the validated staging system of Cutolo et al. is used that categorizes the capillaroscopic changes into an "early", "active" and "late" phase. A "scleroderma-like" capillaroscopic pattern can also be observed in a number of rheumatic diseases, i.e., dermatomyositis (DM), systemic lupus erythematosus (SLE), undifferentiated connective tissue diseases, overlap syndromes, and rheumatoid arthritis (RA).

Objectives: To evaluate the categories "early", "active" and "late" in "scleroderma-like" pattern in rheumatic diseases different from SSc and to assess the presence of discriminating features between "scleroderma" and "scleroderma-like" capillaroscopic pattern.

Methods: 544 capillaroscopic images that showed a "scleroderma" and "scleroderma-like" pattern have been analysed from the following groups: 405 images from 42 SSc patients, 66 images from 4 patients with DM, 37 images from 9 RA patients and 36 images from 5 SLE patients.

Results: 30 of the images obtained from SSc patients demonstrated an "early" phase capillaroscopic pattern, 284 an "active" phase, and 29 a "late" phase. In 62 images, neoangiogenesis could be observed in images from an "active" phase capillaroscopic pattern that could be classified as "active-to late stage of transition." Among the 66 images from DM patients, 43 capillaroscopic pictures revealed an "active" phase and 23 - neoangiogenic capillaries with giant capillary loops, capillary loss and derangement ("active neoangiogenic" pattern). An "early" and "late" phase capillaroscopic pattern was not present in this group. The images from SLE patients (n=36) could be classified into the following groups: 3 images "early" phase, 29 images "active" phase, and 4 images with neoangiogenesis during the active phase. A "late" phase capillaroscopic pattern was not observed. In the group of capillaroscopic pictures from RA patients (n=37), an "early" phase changes could be observed in 11 images (8 out of 9 patients) and an "active" phase in 3 images (2 patients). 23 of the images from RA patients demonstrated evidence of neoangiogenesis associated with mild capillary derangement, moderate capillary loss, and single giant capillaries ("advanced neoangiogenic" pattern).

Conclusion: In conclusion, an "early" phase "scleroderma" pattern is present in RA and SLE patients, but obviously not in DM patients. An "active" phase "scleroderma" pattern was found in all three patients groups other than SSc i.e., DM, SLE and RA. In DM, profound neoangiogenesis is also a characteristic finding. In RA, advanced neoangiogenesis with moderate devascularization and single giant capillaries could also be documented. A classic "late" phase "scleroderma" pattern was found only in SSc patients and was not observed in other rheumatic diseases i.e., SLE, RA, DM. The results of the current study suggest presence of differences between "scleroderma" and "scleroderma-like" capillaroscopic pattern that may reflect different pathogenic mechanisms of microvascular damage.

Disclosure of Interests: Sevdalina Lambova: None declared, Ulf Müller-Ladner Speakers bureau: Biogen

DOI: 10.1136/annrheumdis-2020-eular.2233

THU0536

ASSOCIATION BETWEEN OVERWEIGHT/OBESITY AND DISEASE ACTIVITY ON BONE SCINTIGRAPHY IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: In previous studies, obesity is highly prevalent in patients diagnosed with rheumatoid arthritis and it is positively associated with disease

activity¹. Although Tc-99m-labeled bone scintigraphy has been widely performed to evaluate the disease activity of the joints involved in this disease²; the effect of body mass index (BMI) on the results of bone scintigraphy is yet to be accessed.

Objectives: In the present study, we evaluated the relationship between BMI and uptake intensity of the joints that was measured using bone scintigraphy in patients with rheumatoid arthritis.

Methods: A total of 80 patients (21 men and 59 women; mean age 56±14 years) with rheumatoid arthritis who underwent Tc-99m methylene diphosphonate bone scintigraphy before treatment were enrolled in this study. Data were collected for baseline BMI and disease activity score for the 28 joints using erythrocyte sedimentation rate (DAS28-ESR) of these patients. Uptake intensity of these 28 joints was automatically measured for each patient using an in-house software, expressed as joint uptake-to-background normal bone uptake ratio (joint uptake ratio). The correlation of BMI with DAS28-ESR and joint uptake ratio on bone scintigraphy was assessed.

Results: Mean BMI of the enrolled patients was 24.4±3.7 kg/m² and 50 patients (62.5%) were classified as overweight/obesity. BMI was significantly positively correlated with the sum of 28 joint uptake ratios on bone scintigraphy (p=0.021, correlation coefficient=0.358) as well as DAS28-ESR (p=0.030). Patients with overweight/obesity (39.2±9.5) had significantly higher values of the sum of 28 joint uptake ratios than the other patients (33.9±9.5; p=0.025). In correlation analysis with each joint uptake ratio of 28 joints, BMI more significantly positively correlated with uptake ratios of shoulder, elbow, and knee joints than those in wrist and hand joints. In subgroup analysis of patients having low (DAS28-ESR ≤3.2) and high (DAS28-ESR >3.2) disease activity, BMI still showed significant positive correlation with the sum of 28 joint uptake ratio on bone scintigraphy in both subgroups (p<0.05 for all).

Conclusion: The Baseline BMI in patients with rheumatoid arthritis had significant positive correlation with joint uptake intensity measured on bone scintigraphy, especially for large joints. The results of our study might provide an evidence that supports an association between BMI and disease activity of rheumatoid arthritis.

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Acknowledgments: Research relating to this abstract was funded by the National Research Foundation of Korea (NRF) grant funded by the Korea government (Ministry of Science and ICT) (grant number: NRF-2018R1C1B5040061).

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.631

THU0537

VALIDITY AND DIAGNOSTIC PERFORMANCE OF FLUORESCENCE OPTICAL IMAGING MEASURING SYNOVITIS IN HAND OSTEOARTHRITIS. RESULTS FROM THE NOR-HAND STUDY.

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Background: Fluorescence Optical Imaging (FOI) demonstrates enhanced microcirculation in finger joints as a sign of inflammation.

Objectives: We wanted to assess the validity and diagnostic performance of FOI measuring synovitis, comparing it with Magnetic Resonance Imaging (MRI)- and ultrasound-detected synovitis in persons with hand osteoarthritis (OA).

Methods: Two hundred and twenty-one participants (88% female, age (SD) 60.6 (6.2) years) with hand OA from the Nor-Hand study underwent FOI and grey scale (GS) and power Doppler (PD) ultrasound of the bilateral hands and contrast-enhanced MRI of the dominant hand. The FOI scan was performed after the administration of an intravenous fluorescence dye (indocyanine green, ICG) and 360 images (1/second) were produced in 6 minutes. One reader scored the bilateral distal interphalangeal (DIP), proximal interphalangeal (PIP), metacarpophalangeal (MCP) and first carpometacarpal (CMC-1) joints for FOI enhancement, blinded for clinical information and other imaging data. Images were scored according to the 'FOI activity score' (FOIAS) where four out of 360 images are assessed, defined as phase 1, 2, and 3, based on the inflow and washing out of the fluorescence dye, and a composite image (Prima Vista Mode; PVM) of the 240 first images. Two readers evaluated separately the severity of