TO WHAT EXTENT IS INTEROBSERVER RELIABILITY FOR DETECTING ULTRASOUND URATE CRYSTAL DEPOSITS DEPENDENT ON THE EXPERIENCE OF THE ULTRASONOGRAPHER?

J. Uso,1 E. Garменdia,2 C. Moragues,3 J. J. de Agustin,4 L. Mayordomo,5 E. de Miguel,6 H. Corominas,7 J. Garrido,8 E. Naredo,9 1Rheumatology, Hospital Universitario Móstoles, Madrid; 2Rheumatology, Hospital Universitatia Cruces, Vizaya; 3Rheumatology, Hospital Universitario de Bellvitge, L'Hospitalet del Llobregat; 4Rheumatology, Vall D’Hebron Hospital, Barcelona; 5Rheumatology, Hospital Universitario de Sant Pau, Barcelona; 6Social and psychological methodology, Universitat Autònoma; 7Rheumatology, Hospital Fundación Jiménez Díaz, Madrid, Spain

Background: Musculoskeletal (MS) ultrasound (US) is used for diagnosing and managing gout in clinical practice and has the potential to become an outcome measure for clinical trials. Cartilage double contour sign (DC) and tophi (T) are standard US features for end-stage gout. The reliability of these US features depends on the experience of the ultrasonographer.

Objectives: To compare the agreement between a group of rheumatologist-ultrasonographers (RU) with a variable experience in MSUS with the agreement between rheumatologist-ultrasonographers highly experienced in MSUS and teachers (ExRU) for detecting DC and T in patients.

Methods: 16 RU with a variable experience in MSUS were trained in the OMERACT US definitions for DC and T. Next, as a preliminary reliability exercise, they read 30 different US joint static images from gout patients and healthy subjects for the presence or absence of DC or T. Afterwards the RU group and a group of 5 ExRU consecutively, independently and blindly carried out each a reliability exercise in 5 subjects (3 crystal proven gout patients and 2 healthy controls) for the presence or absence of DC or T. Both groups performed a standardised 8 min bilateral grey-scale US examination of the following: the suprapatellar knee recess for T, femoral knee cartilage for DC, medial and lateral knee compartments for T and dorsal first metatarsal phalangeal for T and metatarsal head for DC. Fleiss kappa was used to assess interobserver reliability. K values 0–0.20 were considered poor; 0.20–0.40 fair; 0.40–0.60 moderate; 0.60–0.80 good and 0.80–1 excellent.

Results: Kappa values were moderate for the RU group inter-reader agreement in static US images (K 0.514 for DC and 0.465 for T). However, there were significant differences between the interobserver agreement from both groups in patients, being kappa values fair (K 0.344 for DC and 0.305 for T) for the RU group while for the ExRU group (K 0.674 for DC and 0.673 for T) (p<0.001 for DC and T). Lowest agreement among RU and ExRU was for detecting DC in MTF joint.

Conclusions: This study showed that although inter-reader agreement for gout lesions can be acceptable in static US images, interobserver agreement in patients is highly dependent on the experience of the ultrasonographers.

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SERUM KL-6 LEVEL REFLECTS SEVERITY OF INTERSTITIAL LUNG DISEASE ASSOCIATED WITH CONNECTIVE TISSUE DISEASE

J. S. Lee,1 E. Y. Lee,2 J. K. Park,3 Y. J. Ha,4 E. H. Kang,5 Y. J. Lee,6 Y. W. Song,1
1Division of Rheumatology, Department of Internal Medicine, Seoul National University Hospital; 2Division of Rheumatology, Department of Internal Medicine, Seoul National University Bundang Hospital, Seoul, Korea, Republic of

Background: Measuring severity of interstitial lung disease (ILD) usually depends on the extent or pattern of imaging findings on computed tomography (CT) and the parameters of pulmonary function test. Krebs von den Lungen 6 (KL-6) is a sialylated glycoprotein mainly expressed on the surface membrane of type II pneumocytes and bronchiolar epithelial cells. Serum level of KL-6 had been reported to be associated with presence or outcome of ILD associated with connective tissue diseases (CTD-ILD).

Methods: Study population was a retrospective cohort of 549 Korean patients with rheumatoid arthritis (RA), systemic sclerosis (SSc), inflammatory myositis (IM), Sjogren’s syndrome (SS), and systemic lupus erythematosus (SLE) who had concurrent ILD or not. Serum concentration of KL-6 (U/mL) was measured by Nanopla KL-6 assay (SEKISUI MEDICAL, Tokyo), using latex enhanced immuno-turbidimetric assay method. Semi-quantitative grade of ILD extent (grade 1: 0%–25%, grade 2: 26%–50%, grade 3: 51%–75%, grade 4: 76%–100%) was evaluated by CT scan. To suggest cutoff value of KL-6 level to differentiate each semi-qualitative grade, receiver operating characteristic curves were drawn. Student t-test and Pearson’s coefficient (PC) were applied to evaluate the correlation of KL-6 level and severity of ILD.

Results: The patients with CTD-ILD (n=165) had elevated serum level of KL-6 compared to CTD without ILD (n=384) (mean ± SD, 741.0 ±724.3 vs 235.1 ±157.0 U/mL, p<0.001). In subgroup analysis, RA (563.9±267.0 vs 231.3±188.5, p=0.001), SSc (766.4±754.6 vs 224.0±120.3, p=0.002), IM (808.1±746.9 vs 291.4±238.6, p<0.001), and SS or SLE (884.9±762.3 vs 225.7±107.0, p=0.001) also had significant difference according to the presence of ILD. Semi-quantitative grade of ILD in CT scan was significantly proportional to KL-6 level among consecutive grade (figure 1). The optimal cutoff values to differentiate each semi-quantitative grade were 684.3 U/ml (grade 2: sensitivity 58.3%, specificity 91.8%), 689.7 U/ml (grade 3: 86.7%, 86.0%, respectively), and 958.3 U/ml (grade 4: 100%, 84.0%, respectively). Percent diffusion capacity for carbon monoxide (DLCO%) and forced vital capacity (FVC%) had negative correlation with KL-6 level (PC<0.057, p<0.001; PC<0.399, p<0.001, respectively).

Conclusions: Serum levels of KL-6 were increased in CTD-ILD and had good correlation with CT grade, FVC, and DLCO. Higher serum level of KL-6 may reflect severity of CTD-ILD.

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Background: Quantitative computed tomography (QCT) can precisely and with high reproducibility measure spine bone mineral density (BMD) using cardiac computed tomography (CT) scans. 1 Standard for diagnosing osteoporosis is a dual-energy X-ray absorptiometry (DXA) scan. 2 Despite DXA being fast and with low radiation, many patients with osteoporosis goes undiagnosed. 3

Objectives: The aim was to characterise the bone mineral density (BMD) status in a group of patients with low to intermediate risk of coronary artery disease (CAD).

Methods: This study is a retrospective, cross-sectional study analysing prospectively acquired data from the Dan-NICAD study. Participants were patients with symptoms suggestive of CAD referred for a cardiac CT between 2014–09 and 2016–03. Patient data were collected from interviews. BMD was measured in 3 vertebras starting from the left main coronary artery using QCT. We used the American college of radiology cut-off values for lumbar spine QCT to categorise patients into very low(<80 mg/cm^2), low(80–120 mg/cm^2), or normal BMD(>120 mg/cm^2).

Results: Analyses included 1487 patients. Mean age was 57 years(range 40–80), 52% were women. The total number of patients with very low BMD was 179 (12%) (105 women, 74 men). The majority of patients with very low BMD was not previously diagnosed with osteoporosis(87%) and received no anti-osteoporotic treatment(80%). Compared to patients with normal BMD, individuals with very low BMD had more risk factors for osteoporosis such as higher age(p<0.001), predisp- position to osteoporosis(p<0.001), and were more often former smokers(p<0.01).

Conclusions: Very low BMD seems present in a significant proportion of men and women, a majority of which were not diagnosed with osteoporosis or receiving anti-osteoporotic medication. Patients with very low BMD had more osteoporosis risk factors compared to patients with normal BMD. Additional screening for osteoporosis can potentially prevent osteoporotic fractures. However, thoracic spine QCT is a new method without diagnostic cut-off values and prospective studies regarding fracture risk prevention are missing.

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