FRI0569

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

J. Usón¹, E. Garmendia², C. Moragues³, J.J. de Agustín⁴, L. Mayordomo⁵, E. de Miguel⁶, H. Corominas⁷, J. Garrido⁸, E. Naredo⁹. ¹Rheumatology, Hospital Universitario Móstoles, Madrid; ²Rheumatology, Hospital Universitario Cruces, Vizcaya; ³Rheumatology, Hospital Universitario de Bellvitge, L'Hospitalet del Llobregat; ⁴Rheumatology, Vall D'Hebron Hospital, Barcelona; ⁵Rheumatology, Hospital Universitario Valme, Sevilla; ⁶Rheumatology, Hospital Universitario la Paz, Madrid; ⁷Rheumatology, Hospital Universitario de Sant Pau, Barcelona; ⁸Social psychology and methodology, Universidad Autónoma; ⁹Rheumatology, 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 elementary US lesions of urate crystal deposits. OMERACT MSUS Working Group developed the first consensus-based definitions for DC and T and showed that the reliability of the definitions ranged from moderate to excellent in static images and somewhat lower in patients when tested in highly experienced MS ultrasonographers.¹

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 U 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 UU 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 good for the ExRU group (K 0.674 for DC and 0.673 for T) ($p < 0.001$ for DC and T). Worst agreement among RU and ExRU was for detecting DC in MTF joint.

	RU ¹⁶			ExRU ⁵			
	95% CI			95% CI			
Tophi (T)	kappa	Lower	Upper	kappa	Lower	Upper	p
Double contour (DC)	0.305	0.275	0.336	0.673	0.575	0.771	<0.001
	0.344	0.301	0.387	0.674	0.535	0.812	<0.001

CI, confidence interval

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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FRI0570

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

J.S. Lee¹, E.Y. Lee¹, J.K. Park¹, Y.-J. Ha², E.H. Kang², Y.J. Lee², Y.W. Song¹. 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).

Objectives: We aimed to evaluate KL-6 as a potential biomarker reflecting severity of 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 Nanopia KL-6 assay (SEKISUI MEDICAL, Tokyo), using latex enhanced immunoturbidimetric 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-quantitative 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 $\pm$ SD, 741.0 $\pm$ 724.3 vs 236.1 $\pm$ 157.0 U/mL, $p < 0.001$). In subgroup analysis, RA (563.9 $\pm$ 627.0 vs 231.3 $\pm$ 188.5, $p < 0.001$), SSc (766.4 $\pm$ 754.6 vs 224.0 $\pm$ 120.3, $p = 0.002$), IM (808.1 $\pm$ 746.9 vs 291.4 $\pm$ 238.6, $p < 0.001$), and SS or SLE (884.9 $\pm$ 762.3 vs 225.7 $\pm$ 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 = -0.587, $p < 0.001$; PC = -0.399, $p < 0.001$, respectively).

Abstract FRI0570 – Figure 1. Serum level of KL-6 of the ILD patients stratified by semiquantitative CT grade.

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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