FRI0569 **TO WHAT EXTENT IS INTEROBSERVER RELIABILITY FOR DETECTING ULTRASOUND URATE CRYSTAL DEPOSITS DEPENDENT ON THE EXPERIENCE OF THE ULTRASONOGRAPHER?**

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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 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		
	kappa	Lower	Upper	kappa	Lower	Upper	p
Tophi (T)	0.305	0.275	0.336	0.673	0.575	0.771	<0.001
Double contour (DC)	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 DISEASEASSOCIATED WITH CONNECTIVE TISSUE DISEASE**

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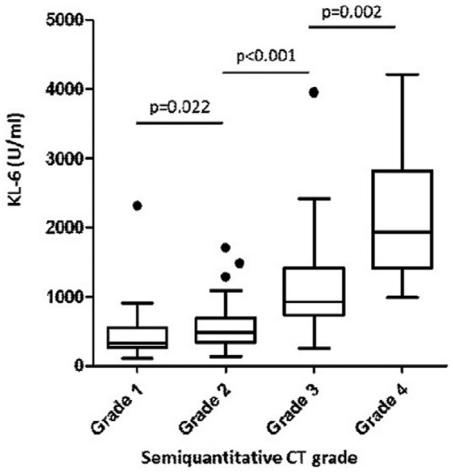
Background: Measuring severity of interstitial lung disease (ILD) usually depends on the extent or pattern of imaging findings on computed tomography (CT) and the parameters of pulmonary function test. Krebs von den Lungen 6 (KL-6) is a sialylated glycoprotein mainly expressed on the surface membrane 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 semiquatitative 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 236.1 ±157.0 U/mL, p<0.001). In subgroup analysis, RA (563.9±627.0 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 semiquantitative 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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FRI0571 **ADDITIONAL SCREENING FOR LOW THORACIC BONE MINERAL DENSITY IN PATIENTS REFERRED FOR CARDIAC CT – A DANISH, MULTI-CENTRE, AND CROSS-SECTIONAL STUDY**

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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 vertebrae 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^3), low(80–120 mg/cm^3), or normal BMD(>120 mg/cm^3).
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(90%). Compared to patients with normal BMD, individuals with very low BMD had more risk factors for osteoporosis such as higher age(p<0.001), predisposition 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 osteoporotic 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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FRI0572 **PREVALENCE OF ECHOCARDIOGRAPHIC FINDINGS IN CONNECTIVE TISSUE DISEASES – A RETROSPECTIVE COHORT STUDY**

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Background: Echocardiography is routinely performed in patients with connective tissue diseases (CTD), mostly to evaluate cardiac involvement or development of pulmonary arterial hypertension (paH). Despite its frequent application there is incomplete data for the range and frequency of findings.
Objectives: 1) To study the frequency of echocardiographic findings in routinely examined patients with different CTD. 2) To report which findings were associated with a history of inflammatory cardiac involvement. 3) To analyse whether findings changed over time in patients with several examinations.
Methods: Retrospective chart review of all consecutive patients from a tertiary rheumatological referral centre with CTD diagnosis and echocardiographic examination between 01/01/2006 and 31/12/2015. For each echocardiographic finding, the proportion of patients per diagnosis with a pathological result in at least one examination was calculated. Each finding´s frequency was compared between patients with and without previously documented inflammatory cardiac involvement; p<0.05 in Fisher´s exact test was considered significant. For patients with more than one visit, we recorded how often findings developed or resolved between two consecutive examinations.
Results: 1004 patients with different CTD and a total of 1660 performed echocardiographies were analysed. Table 1 displays the frequency of findings in the whole cohort and for each CTD. The following findings were significantly more common in patients with known inflammatory cardiac involvement (n=109) than in those without (n=896): regurgitation of tricuspid valve (45.0% (n=49) of patients with cardiac involvement vs. 23.2% (n=206) of patients without, p<0.001) and of pulmonary valve (15.6% (n=17) vs. 6.1% (n=54), p=0.001); global hypokinesia (3.7% (n=4) vs. 0.4% (n=4), p=0.007); dilatation of left atrium (33.9% (n=37) vs. 17.5% (n=156), p<0.001), of left ventricle (LV) (11.0% (n=12) vs. 5.1% (n=45), p=0.025), of right atrium (15.6% (n=17) vs. 1,7% (n=15), p<0.001) and of right ventricle (15.6% (n=17) vs. 1.9% (n=17), p<0.001); signs of paH (28.4% (n=31) vs. 5.3% (n=47), p<0.001), and pericardial effusion (43.1% (n=47) vs. 6.5% (n=58), p<0.001). 314 patients had consecutive examinations; medium interval between first and last examination was 40 months (SD: 28, range: 0.9–115). New development or resolution of findings between consecutive examinations was common. The findings which most commonly developed were mitral valve regurgitation in 24% (n=76) of patients, tricuspid regurgitation in 21% (n=67), aortic valve sclerosis in 18% (n=55) and LV dysfunction in 20% (n=62). The findings which most commonly resolved were mitral regurgitation in 15% (n=47) of patients, tricuspid regurgitation in 16% (n=49), aortic valve sclerosis in 10% (n=31) and LV dysfunction in 13% (n=42).

Abstract FRI0572 – Table 1. Frequency of echocardiographic findings in patients with CTD

		Sjögren´s syndrome			*Systemic sclerosis*			*Myositis*				
	All patients	SLE	Primary	Secondary	Diffuse	Limited	With Myos.	PM	DM	Anti-Jo1	UCTD	MCTD
Number of patients	1004	190	208	115	84	145	17	21	29	17	93	85
Valvular regurgitation n(%)												
Mitral	368 (37)	87 (46)	78 (38)	44 (38)	41 (49)	46 (32)	3 (18)	6 (29)	10 (34)	4 (24)	20 (22)	29 (34)
Aortic	178 (18)	26 (14)	44 (21)	29 (25)	15 (18)	29 (20)	1 (6)	3 (14)	3 (10)	3 (18)	8 (9)	17 (20)
Tricuspid	255 (25)	45 (24)	50 (24)	25 (22)	31 (37)	52 (36)	5 (29)	3 (14)	2 (7)	5 (29)	20 (22)	17 (20)
Pulmonary	71 (7)	6 (3)	20 (10)	5 (4)	10 (12)	11 (8)	2 (12)	1 (5)	0	5 (29)	4 (4)	7 (8)
Valvular sclerosis												
Mitral	96 (10)	20 (11)	18 (9)	15 (13)	13 (15)	15 (10)	1 (6)	0	3 (10)	2 (12)	6 (6)	3 (4)
Aortic	202 (20)	25 (13)	38 (18)	43 (37)	26 (31)	33 (23)	5 (29)	2 (10)	4 (14)	5 (29)	11 (12)	10 (12)
Tricuspid	3 (0)	0	0	1 (1)	0	1 (1)	0	0	0	0	1 (1)	0
Pulmonary	1 (0)	0	0	1 (1)	0	0	0	0	0	0	0	0
Valvular stenosis												
Mitral	10 (1)	2 (1)	1 (0)	0	1 (1)	3 (2)	0	0	1 (3)	1 (6)	0	1 (1)
Aortic	45 (4)	4 (2)	6 (3)	13 (11)	9 (11)	6 (4)	0	2 (10)	0	1 (6)	2 (2)	2 (2)
Tricuspid	1 (0)	0	0	0	1 (1)	0	0	0	0	0	0	0
Pulmonary	1 (0)	0	0	1 (1)	0 (0)	0	0	0	0	0	0	0
Contraction and ejection												
LV dysfunction	216 (22)	29 (15)	39 (19)	33 (29)	24 (29)	42 (29)	4 (24)	2 (10)	5 (17)	3 (18)	20 (22)	15 (18)
EF reduced (all)	93 (9)	19 (10)	11 (5)	11 (10)	14 (17)	16 (11)	2 (12)	1 (5)	1 (3)	3 (18)	10 (11)	5 (6)
EF 45-54%	50 (5)	10 (5)	3 (1)	4 (3)	10 (12)	9 (6)	1 (6)	1 (5)	1 (3)	3 (18)	4 (4)	4 (5)
EF 30-44%	30 (3)	7 (4)	6 (3)	4 (3)	3 (4)	5 (3)	0	0	0	0	4 (4)	1 (1)
EF < 30%	13 (1)	2 (1)	2 (1)	3 (3)	1 (1)	2 (1)	1 (6)	0	0	0	2 (2)	0
Local akinesia	66 (7)	16 (8)	10 (5)	8 (7)	9 (11)	7 (5)	0	2 (10)	0	4 (24)	5 (5)	5 (6)
Global hypokinesia	8 (1)	1 (1)	0	0	3 (4)	2 (1)	0	0	0	1 (6)	0	1 (1)
Muscular hypertrophy and cavity dilatation												
LV hypertrophy	46 (5)	9 (5)	7 (3)	9 (8)	8 (10)	4 (3)	0	1 (5)	0	2 (12)	3 (3)	3 (4)
Concentric hypertrophy	6 (1)	1 (1)	1 (0)	0	2 (2)	0	0	0	1 (3)	1 (6)	0	0
Septal hypertrophy	50 (5)	7 (4)	7 (3)	10 (9)	8 (10)	8 (6)	0	1 (5)	2 (7)	2 (12)	1 (1)	4 (5)
LA dilatation	193 (19)	35 (18)	35 (17)	34 (30)	28 (33)	20 (14)	3 (18)	4 (19)	3 (10)	8 (47)	13 (14)	10 (12)
LV dilatation	57 (6)	12 (6)	10 (5)	9 (8)	5 (6)	2 (1)	0	3 (14)	0	4 (24)	8 (9)	4 (5)
RA dilatation	32 (3)	1 (1)	8 (4)	5 (4)	6 (7)	5 (3)	1 (6)	1 (5)	0	1 (6)	1 (1)	3 (4)
RV dilatation	34 (3)	5 (3)	9 (4)	1 (1)	5 (6)	5 (3)	2 (12)	1 (5)	0	1 (6)	2 (2)	3 (4)
Other findings												
Signs of paH	78 (8)	11 (6)	11 (5)	5 (4)	20 (24)	16 (11)	1 (6)	2 (10)	0	4 (24)	3 (3)	5 (6)
Pericardial effusion	105 (10)	32 (17)	14 (7)	9 (8)	15 (18)	10 (7)	2 (12)	1 (5)	3 (10)	5 (29)	6 (6)	8 (9)
Aneurysm	11 (1)	6 (3)	1 (0)	1 (1)	0	1 (1)	0	0	1 (3)	0	0	1 (1)

Abbreviations: SLE: Systemic Lupus Erythematodes, Myos.: Myositis; PM: Polymyositis, DM: Dermatomyositis, UCTD: Undifferentiated Connective Tissue Disease, MCTD: Mixed Connective Tissue Disease, LV: left ventricle, EF: ejection fraction, LA: left atrium, RA: right atrium, RV: right ventricle, paH: pulmonal artery hypertension

Conclusions: Echocardiographic examinations frequently revealed structural and/or functional abnormalities in patients with CTD. Some findings were associated with previous cardiac involvement and might be disease-related. When reevaluating a patient, findings had often newly developed or resolved since the last examination. Overall, repeated echocardiographic examinations may be a valuable part of follow-up in CTD patients.

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FRI0573 **ULTRASONOGRAPHY AND HISTOLOGICAL DIAGNOSIS CONCORDANCE IN PATIENS WITH SUSPECTED PRIMARY SJÖGREN SYNDROME**

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Background: Minor salivary gland biopsy (MSGB) is the most used diagnostic tool for primary Sjögren Syndrome (SS). The potential relevance of an alternative