Conclusions: In combination with the HEP-2 cell assay, the *SeraSpot*[®] ANA assay can be used as a novel cost-effective multiplex assay for the serological confirmation of CTDs.

REFERENCE:

- [1] Mahler M, Meroni PL, Bossuyt X, Fritzler MJ. Current concepts and future directions for the assessment of autoantibodies to cellular antigens referred to as anti-nuclear antibodies. *J Immunol Res* 2014; Article ID 315179, doi.org/10.1155/2014/315179

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.5594

AB1198

THE DIFFERENCES OF THE DISTRIBUTION OF FEEDING VESSELS AND BONE SURFACE IRREGULARITY BETWEEN YOUNG AND ELDERLY ADULTS IN WRIST JOINTS OF HEALTHY VOLUNTEERS BY MUSCULOSKELETAL ULTRASOUND (MSKUS)

K. Misaki¹, K. Ikeda², K. Inoue¹, Y. Imaizumi³. ¹Department of Rheumatology, KITA-HARIMA MEDICAL CENTER, Ono; ²Department of Allergy and Clinical Immunology, Chiba University, Chiba; ³Department of Orthopaedic surgery, Kita-Harima Medical Center, ono, Japan

Background: Synovial vascularity as measured by power Doppler (PD) of MSKUS is correlated to rheumatoid arthritis disease activity, and PD signal reveals the prevalence of subclinical synovitis overlooked on physical examination. It is often difficult to distinguish bone erosion from normal concave surface of the bone, and it is necessary for us to be familiar with these normal structures well in evaluating disease activity by using MSKUS. Here we examine the age-specific differences of normal feeding vessels and bone surface irregularity between in wrist joints.

Objectives: To elucidate the differences of distribution of feeding vessels and bone surface irregularity in wrist joints both young and older adults among healthy volunteers.

Methods: The dorsal side of wrist joints was scanned with 2D-probe in healthy volunteers (young <50 y.o., elder ≥50 y.o.). The distribution of feeding vessels in the capsule and the extensor(E.) tendon sheath(TS), and the evaluation of bone surface irregularity at lunate(Lu) were examined. The comparative review between young and elderly adults was validated.

Results: The distribution of feeding vessels in younger healthy volunteers (n=30: mean age 32.2±8.0 y.o.) vs elderly healthy volunteers (n=21: mean age 66.0 ±7.2 y.o.) were near-Trapezoid (Rt100.0% vs 100.0%, Lt100.0% vs 100.0%: p=1.00), E.digitum TS(Rt86.7% vs 81.0%:p=0.59, Lt66.7% vs 76.2%:p=0.47), E. digiti minimi TS(Rt30.0% vs 52.4%:p=0.11, Lt30.0% vs 66.7%:p=0.0089), near-Capitate (Rt23.3% vs 42.9%:p=0.14, Lt30.0% vs 47.6%:p=0.21), near-TFCC (Rt16.7% vs 19.0%:p=0.83, Lt30.0% vs 38.1%:p=0.56), distal radial side of radio-carpal joint(Rt20.0% vs 42.9%:p=0.08, Lt23.3% vs 28.6%:p=0.68), distal end of Ulna(Rt10.0% vs 42.9%:p=0.006, Lt16.7% vs 28.6%:p=0.31), feeding vessels from vascular channels were depicted at Lu(Rt53.3% vs 52.4%:p=0.95, Lt46.7 vs 66.7%:p=0.16), Radius(Rt20.0% vs 33.3%:p=0.29, Lt16.7% vs 23.8%:p=0.54), Triquetrum (Rt10.0% vs 42.9%:p=0.0057, Lt16.7% vs 33.3%:p=0.17) and Capitate(Rt6.7% vs 33.3%:p=0.013, Lt10%vs33.3%:p=0.0395). The bone surface irregularity as a transverse diameter (Mean ±S.D.) at Lu of dominant hand in both groups were 1.26±0.33 vs 1.14±0.2 mm:p=0.21, respectively.

Conclusions: The frequency of feeding vessel's distributions in elderly adults were significantly higher at E.digiti minimi TS, distal end of Ulna and Triquetrum/Capitate vascular channels compared to those of younger adults. It is suggested that these differences are crucial to evaluate the age-specific synovitis with ultrasound.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.3850

AB1199

DYNAMIC ULTRASOUND FOR MULTILEVEL EVALUATION OF MOTION AND POSTURE IN LOWER EXTREMITY AND SPINE

R.V. Bubnov^{1,2}, L. Kalika³, L. Babenko². ¹Diagnostic and interventional ultrasound, Clinical hospital "Pheophania"; ²Interferon, Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine, Kyiv, Ukraine; ³<https://nydnrehab.com/>, New York Dynamic Neuromuscular Rehabilitation and Physical Therapy, New York, USA

Background: Evaluation of motion and posture is a crucial task in management patient with rheumatic diseases and pain. Integrative protocol including multilevel assessment of intrinsic/extrinsic muscles postural imbalance for disease staging and treatment efficacy control has not been finally developed.

Objectives: The aim was to study feasibility of multilevel motion and posture analysis using dynamic M-mode ultrasound in foot, ankle, gluteus region, pelvis and spine.

Methods: We included 21 patients (13 females, aged 18–52 y.o.) with clinically diagnosed reduced motility in spine, pelvis and lower extremity levels due to detected back leg, pain, muscle spasticity, joints effusion, tissue swelling, etc. Another healthy 20 patients (aged 18–50 y.o.) without movement restriction and pain were controls. We conducted precise physical tests, extensive neuromuscular ultrasound (US) using M-mode to evaluate muscle thickness, CSA and motion in intervertebral spaces, pelvis, intrinsic/extrinsic muscles in foot and ankle gluteus region and pelvis, central and peripheral trigger points identification.¹

Results: We obtained sufficient quality panoramic scans on leg using convex 5–8 MHz probe in 2 approaches to evaluate structure and motion of extrinsic/intrinsic portion of muscles during one session. Thickness measurements of peroneal portion, plantar intrinsic foot muscles on the plantar surface in two transverse positions and one longitudinal using linear probe; contractility using M-mode tested in walking were most representative data. We evaluated different patterns of decreasing motility, contractility (muscle contracted/rested thickness) on M-mode during functional tests and walking in all levels in group 1 (p<0.05). We observed the preliminary correlation between the changes (muscle hypertrophy) in contralateral extrinsics and intrinsic muscles at the same levels, due to biomechanical instability; local areas of spasticity (trigger points) were successfully detected on distal/proximal leg, pelvis and spine. Documented pictures were collected and accessible for telemedical consulting.

Conclusions: Extensive evaluation of motion posture in foot, ankle, and gluteus region, pelvis and spine is feasible and informative protocol for patient with pain and rheumatic diseases. Further studies needed to evaluate reliability studies, comparative RCT using US, CAREN, static and dynamic balance tests, pressure analysis, and extensive molecular profiling, to study crosslinks with immune phenotype of the patients; and to develop educational programs.

REFERENCE:

- [1] Bubnov R Trigger Points Dry Needling Under Ultrasound Guidance for Low Back Pain Therapy. Comparative Study. *Annals of the Rheumatic Diseases* 2015;74:624. <http://dx.doi.org/10.1136/annrheumdis-2015-eular.2323>

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.3949

AB1200

FROM THE CALCANEUS QUANTITATIVE ULTRASONOGRAPHY (QUS) TO THE FEMORAL RADIOFREQUENCY ECHOGRAPHIC MULTI SPECTROMETRY (REMS): NON-IONISING APPROACHES TO DIAGNOSIS OSTEOPOROSIS PROPOSED BY F.I.R. M.O. FOUNDATION

L. Cavalli^{§1,2,*}, L. Cianferotti^{§3}, F. Giusti^{§3}, G. Gronchi^{§3}, P. Pisani^{§2}, M.L. Brandi^{§3}.

¹Department of Surgery and Translational Medicine, University of Florence, Metabolic Bone Diseases Unit, University Hospital of Florence, Firenze; ²Institute of Clinical Physiology, National Research Council, Lecce; ³Department of Surgery and Translational Medicine, University of Florence, Metabolic Bone Diseases Unit, University Hospital of Florence, Florence, Italy, Firenze, Italy

Background: The high prevalence of osteoporosis and its insidious development, often silent until a fracture occurs, make it necessary to resort to prevention by promoting early diagnosis and educational programmes for a healthy life style.

Objectives: To develop screening campaigns of the Italian population for the osteoporosis prevention thanks to the collaboration with F.I.R.M.O. Foundation (Fondazione Italiana Ricerca Malattie Ossee).¹

Methods: An experienced medical staff administered to the afferent people the IOF "One minute risk test" questionnaire, (to detect the presence of clinical risk factors), together with a densitometric examination performed by a portable device aboard a mobile unit, in several Italian cities between 2011 and 2017.

The technique employed to assess bone status in 2011 and 2012 was calcaneus Quantitative Ultrasonography (QUS), applied to a peripheral skeletal site, which has been shown as effective in identifying osteoporotic men or post-menopausal women.² Although representing a low-cost and accessible approach, the heel measurement of speed of ultrasound (SOS) can be influenced by foot positioning, oedema and temperature.³

Since 2017, a novel non-invasive densitometric technique is available, which allows to evaluate the axial fragile bone sites (spine and femur). It is Radiofrequency Echographic Multi Spectrometry (REMS), that a multicentric clinical study has been shown to provide parameters highly correlated with DXA ones.

Results: As measured by calcaneus QUS in 7305 subjects, the prevalence rate of osteoporosis was approximately 18.7%, while the 42.6% had a T-score compatible with osteopenia. People with a QUS T-score <−2.5 was recommended to early undergo a DXA at lumbar and femoral sites and a specialist visit.

On the other hand, REMS examinations at femoral neck, performed on 397 people, revealed that osteoporosis resulted in 25% of the sample and osteopenia in 54%. Also in this case, people with a T-score < -2.5 was suggested to perform a DXA, considering that the accuracy and operator-independent automatic analysis performed by REMS, make more reliable the obtained data.

Conclusions: Nowadays, with REMS introduction, F.I.R.M.O. foundation and the health system could avail themselves of a new non-invasive, rapid, easy-to-use and automatized technology for the prevention of osteoporosis.

§ Equal contributors listed in alphabetical order

REFERENCES:

- [1] Cavalli L, Guazzini G, Cianferotti L, et al. "Prevalence of osteoporosis in the Italian population and main risk factors: results of BoneTour Campaign". *BMC Musculoskeletal Disorders* (2016) 17:396; DOI 10.1186/s12891-016-1248-8
- [2] Krieg MA, Barkmann R, Gonnelli S, Stewart A, Bauer DC, Del Rio Barquero L, et al. Quantitative ultrasound in the management of osteoporosis: the 2007. ISCD official positions. *J Clin Densitom*. 2008;11:163
- [3] Hans D, Krieg MA. Quantitative ultrasound for the detection and management of osteoporosis. *Salud Publica Mex* 2009;51 suppl 1:S25-S37

Acknowledgements: The authors are grateful to F.I.R.M.O. Foundation for promoting these screening campaigns.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.7439

AB1201

ULTRASONOGRAPHY POWER DOPPLER(PDUS) IN EARLY ARTHRITIS. DOES 44 JOINT COUNT PREDICTE MORE ACCURETLY THE DEVELOPMENT OF RA THAN OTHER ULTRASOUND COUNTS?

L. Mayordomo¹, C. Almeida², M.C. Jurado³, M.L. Velloso¹, P. González-Moreno⁴, J.L. Marenco¹. ¹Rheumatology Department; ²Research and Statistics Unit; ³Radiology Department, Hospital Universitario Valme; ⁴Rheumatology department, HVM, Sevilla, Spain

Background: Early rheumatoid arthritis is a diagnostic challenge for the rheumatologist since early treatment may be crucial for reaching remission and low rate of structural damage. Previous correlation studies between different ultrasonographic (US) scores suggested that few joint examination may be equivalent to more comprehensive ones about the inflammatory activity in established rheumatoid arthritis.

Objectives: To determine if the presence of basal power doppler US signal in patients with early arthritis by three different US joint counts (12, 28 or 44 joint based) may be equally useful in order to establish the risk of final diagnosis of rheumatoid arthritis (RA) according ACR criteria 1987 at a year of follow up.

Methods: We studied the presence of US Power Doppler (PD) signal on 28 joints (shoulders, elbows, wrists, MCPs, PIPs, knees), 44 joints (28 joints and in addition hips, ankles, tarsus and MTP joints) and in 12 joints (elbows, MCFs 2 and 3, wrists, knees and ankles), with a mid-range equipment GE L5 in 70 patients with suspected RA. The patients met at least one of the following inclusion criteria: a) Swelling in 2 or more joints b) pain in MCPs, MTPs and/or the wrists c) morning stiffness of more than 30 min with <12 months of duration of the symptoms and no previous steroid nor DMARDs treatment. At one year of follow-up was established whether patients met ACR 1987 classification criteria for RA or not. PD signal was scored 0-3, and PD score sum index (IPD) was the total sum of scores in each joint for 44, 28 and 12 joint counts. Correlations between 44, 28 and 12 joint US IPDs were studied as well. Statistical study: Chi-square, Fisher exact test, p univariate, Odds Ratio, Spearman correlation.

Results: The presence of basal power doppler signal in ≥1 joint of 44 (PD44) is associated to RA diagnosis at 12 months by ACR 1987 criteria, p=0.003, OR=5.43^{1,71-17,24} but the presence of ≥1 joint with power doppler signal of 28 joints (PD28) did not (p=0.051). The presence ≥1 joint with basal power doppler signal of 12 joints (PD12) was associated to RA diagnosis at 12 months with OR 3.11^{1-12-8,6} p=0.026 as well, so may predict development of RA. However, we missed 6/44 (14%) of patients that were not diagnosed of RA when we evaluate only 12 joints. We found high correlations between IPD44 and IPD28 (0.845), IPD44 and IPD12 (0.807) and between IPD28 and IPD12 sum scores (0.913).

BASAL VARIABLES n=70		RA YES	p (univariate)	OR	95% CI
PD 44	YES	38/52 (73,1%)	0.003	5,43	(1,71-17,24)
	NO	6/18 (33,3%)			
PD 28	YES	35/50 (70%)	0.051	-	-
	NO	9/20 (45%)			
PD 12	YES	32/44 (93,9%)	0.026	3,11	(1,12-8.60)
	NO	14/26 (53,7%)			

Abstract AB1201 – Figure 1

Conclusions: The presence of at least one joint with power doppler signal of 44 joints (PD44) on baseline visit may help to predict the RA diagnosis at 12 months of follow up according ACR 1987 criteria in patients with early RA, but PD28 did not. PD12 reduced joint count may help to predict RA as well but missed 14% of RA patients. Odds ratio rendered better information for different PD joint count about early identification of RA, whereas correlations were high between all different US joint scores. Further studies are required to decide the best US joint set for early identification of patients with early rheumatoid arthritis, but inclusion of ankle/foot joints may be important.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.5904

AB1202

IS FLUORESCENCE OPTICAL IMAGING ASSESSMENT ASSOCIATED WITH ULTRASONOGRAPHY SYNOVITIS IN THE WRIST AND HAND OF RHEUMATOID ARTHRITIS PATIENTS?

M.A. Danielsen, M. Østergaard, L. Terselv, D. Glinatsi. Copenhagen Center for Arthritis Research, Center for Rheumatology and Spine Diseases, Rigshospitalet, Copenhagen, Denmark

Background: Fluorescence optical imaging (FOI) has been used for assessment of inflammation (i.e. synovitis) in the hands and has in several cross sectional studies been compared with ultrasonography (US) and magnetic resonance imaging (MRI), using different, but not validated scoring systems.

Objectives: The primary objective was to examine the association between FOI and US for assessment of synovitis in the rheumatoid arthritis (RA) hands, in a longitudinal study, using a new validated and clinically feasible FOI scoring system.

Methods: 46 RA patients, eligible for induction or intensification of conventional synthetic or biological disease modifying anti-rheumatic drugs and with ≥1 clinically swollen joint in the hand, were included. FOI image-sets of both wrists and hands were obtained at baseline and 6 months' follow-up using a Xiralite system unit (nanoPET Pharma GmbH, Berlin, Germany). The patients received a bolus of i.v. indocyanine green (ICG) pulsion 10 s after starting the examination, which obtained 1 image/second for 6 min.

All FOI images were scored by two readers for synovitis at the wrist, 1st-5th metacarpophalangeal, 1st interphalangeal and 2nd-4th proximal interphalangeal joint levels in both hands, using the novel semiquantitative scoring system. Each joint was scored 0-3 (range 0-66) for synovitis. The readers were blinded to patient data, but not chronology and had previously showed a high intra- and inter-reader agreement (intra-class correlation coefficient (ICC):0.70-0.92).

For ultrasound assessment, a GE Logiq E9 US unit with a high frequency linear 6-15 ML probe and with Doppler settings according to published recommendations was used. Synovitis was scored from 0-3 for grey scale (GS) and Doppler (DP) using the OMERACT US synovitis scoring system by two trained assessors who had previously demonstrated high intra- and inter-reader agreement (wKappa:0.88-0.95).

DAS28-CRP and swollen joint count (SJC) in the hand were assessed at both time points.

Descriptive statistics and the Wilcoxon signed-rank test were used to assess change in score over time. Agreement for status and change scores were assessed using single measure ICCs and spearman's correlation (SP). Responsiveness was assessed using standardised response mean (SRM).

Results: Median (IQR) total score at baseline was FOI 11.0 (6;19), GS 14.5 (8;22), DP 8 (3;14), DAS28 5 (4.4;5.4) and SJC 6 (3;8) and improved with -7.8 (-13;-3.5) -9 (-15;-3.5), -5.5 (-11;-0.5), -2(-2.9;-0.8) and -4(-7;-2) at 6 months' follow up, respectively (p<0.01). Figure 1 presents the change score and a trend line based on 4 patients' average score.

ICC and SP between FOI and US (GS and DP) total scores were low for both readers at baseline (range 0.3-0.4) (p<0.05), and low to moderate (range 0.31-0.54) (p<0.01) for change scores. The mean SRM for total change scores between baseline and 6 months' follow-up were good for all parameters (FOI:0.9,