Conclusion: The study highlighted that a reduced DLCO in lung function test is associated with a lung involvement in IRD. DLCO represented a potential screening parameter for lung manifestation in IRD. Especially patients with suspected vasculitis should receive an additional chest x-ray. Based on the high sensitivity of DLCO in combination with chest x-ray or HR-CT for the detection of ILD in IRD, all patients with a reduced DLCO (< 80%) should obtain an imaging of the lung.

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AB0797

THE ROLE OF ULTRASOUND CRITERIA IN ASSESSING PAIN SYNDROME IN THE KNEE JOINT IN PATIENTS WITH RHEUMATOID ARTHRITIS AND OSTEOARTHRITIS

N. Aleksandrova¹, A. Aleksandrov^{1,2}. ¹Federal State Budgetary Institution «Research Institute of Clinical and Experimental Rheumatology named after A.B. Zborovskiy», Department of Functional Research Method, Volgograd, Russian Federation; ²Volgograd State Medical University, Department of Hospital Therapy, Volgograd, Russian Federation

Background: Pain syndrome and pathological changes in the synovium detected by ultrasound can be early signs of various diseases of the joints [1].

Objectives: the use of ultrasound criteria for changes in the synovial membrane of the joint cavity to assess the severity of pain in patients with rheumatoid arthritis (RA) and osteoarthritis (OA).

Methods: The study included 36 patients with RA (32 women and 4 men aged 22 to 55 years old) and 38 patients with OA (30 women and 8 men aged 30 to 50 years old) with lesions of the knee joints. A visual analogue scale (VAS) was used to determine the severity of pain. The severity of pain in the knee when walking was at least 40 mm according to the VAS in all examined patients. Joint ultrasound examination was carried out according to the standard technique using a linear transducer with a frequency of 5–12 MHz on an Accuvix V10 ultrasound diagnostic system (Samsung Medison, South Korea). The evaluation of ultrasound changes in the upper inversion of a knee joint was carried out according to the following criteria: the severity of intra-articular effusion (1), synovial proliferation (2), local vascularization of the synovial membrane using power Doppler (3) (Table 1).

Table 1. Parameters of ultrasound criteria for assessing changes in the synovial membrane of the joint cavity

Normal indicators	1 - width of the suprapatellar turn is 6 mm 2 - thickness of the synovial membrane is 3 mm (from the anterior approach)
Minimum changes	3 - lack of vascularization loci 1 - delamination of the suprapatellar curl leaves from 7 to 9 mm 2 - thickness of the synovial membrane 3.1–4.5 mm
Moderate changes	3 - appearance of single loci of vascularization (1-2 in the Doppler field) 1 - delamination of the leaves of the suprapatellar twist 10-14 mm 2 - thickness of the synovial membrane is 4.6–6.4 mm
Severe changes	3 - appearance of moderate (> 5) vascularization loci 1 - delamination of suprapatellar folds of more than 15 mm 2 - thickness of the synovial membrane is more than 6.5 mm 3 - multiple foci of vascularization (> 5, merging in places)

Results: Correlations of various severity were found between pain indices according to VAS and the thickness of the synovial membrane of the knee joint ($r = 0.33$, $p = 0.019$) and the number of vascularization foci ($r_s = 0.29$, $p = 0.04$) in RA patients, as well as between pain according to VAS and the severity of intra-articular effusion ($r = 0.28$, $p < 0.002$) in patients with OA.

The patients were divided into three groups according to the severity of pain in the knee joint: group I - 41-59 mm (12 patients with OA and 9 patients with RA), group II - 60-79 mm (16 patients with OA and 12 patients with RA), group III - 80–100 mm on the VAS scale (10 patients with OA and 15 patients with RA). Group I was dominated by OA patients with minimal changes in intra-articular effusion and local vascularization of the synovial membrane, with moderate synovial proliferation (28.6% of the total number of patients in the group). In group II patients with OA with moderate severity of intra-articular effusion and local vascularization (21.4%) and patients with RA with moderate changes in the thickness of the synovium and local vascularization (25%) were equally common. Group III was dominated by RA patients with severe synovial proliferation and moderate local vascularization (28%), as well as patients with OA with moderate intra-articular effusion (20%). Significant differences in the thickness of the synovium in patients with RA in the first and third groups were noted (H -test = 5.9, $p = 0.025$).

Conclusion: The additional use of ultrasound criteria for changes observed in the synovial membrane of the joint cavity in patients with RA and OA can help predict pain in the knee joint. The manifestation of pain syndrome in patients with OA is most associated with the severity of synovitis in the joint, and in patients with RA - with the severity of synovial proliferation.

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AB0798

IS THERE A REPRODUCIBILITY OF THE HISTOGRAM AND GRAY SCALE IN ECOEXTRUCTURAL DAMAGES IN RHEUMATOLOGICAL DISEASES?

J. A. Mendonça¹, I. Siste de Almeida Aoki¹, C. C. Cavuto², V. A. Leandro-Merhi³, J. L. B. D. Aquino³ on behalf of Postgraduate Program in Health Sciences, Pontifical Catholic University of Campinas.. ¹Pontifical Catholic University of Campinas, Rheumatology/Postgraduate Program in Health Sciences, Campinas, Brazil; ²Pontifical Catholic University of Campinas, Rheumatology/Scientific Initiation Program, Campinas, Brazil; ³Pontifical Catholic University of Campinas, Postgraduate Program in Health Sciences, Campinas, Brazil

Background: The gray scale (GS) in high resolution ultrasound is already well validated for use in rheumatological diseases, but the color map or the histogram, can be considered a new proposal, to better define and complement the echotextural damages detection¹.

Objectives: To calculate the lesions area measures reproducibility index in arthropathies, between 3 blind evaluators and correlate these measures using the GS and the histogram.

Methods: Observational and retrospective study approved by the ethics committee of the Pontifical Catholic University of Campinas, with the opinion number: 1.526.307. A total of 29 patients have been assessed (31% males and 69% females) on period 2014 to 2019 in Rheumatology service. A MyLab 50 -Esaote equipment was used with frequency transducer that ranged between 6.0 and 18.0 MHz, 10 different area measures were performed from each recorded images previously, by the GS and the histogram. Statistical analysis: Spearman's correlation coefficients, Lin's concordance coefficient (CCC) and the intraclass correlation coefficient (ICC) and their respective 95% confidence intervals, with the SPSS software package for Windows v. 17.0 (SPSS Inc., Chicago, IL, USA).

Results: Average age 43.5 ± 21.5 years of age; with disease duration that varied between ≤ 1 month (48.3%) and ≥ 36 months (24.1%); with the following diseases: juvenile idiopathic arthritis (17.24%); osteoarthritis (13.79%); psoriatic arthritis (13.79%); undifferentiated spondyloarthritis (3.44%); gout (20.68%); rheumatoid arthritis (27.58%) and reactive arthritis (3.44%). A total of 840 measures of exudative (27.58%), proliferative (27.58%) and snowstorm appearance (6.89%) synovitis were performed; femoral-condyle cartilage (3.44%); synovial cyst (3.44%); paratendinitis (6.89%); calcification (3.44%); nail enthesitis (3.44%); tenosynovitis (6.89%) and tophi (10.34%) (Figure 1). The concordance correlation coefficient showed values closer to 1; $p < 0.001$, the intraclass correlation coefficients with excellent reproducibility ($ICC \geq 0.75$); $p < 0.001$, always in relation to the three evaluators (Table 1) and the Spearman correlation between the GS and the histogram ranged from $r_s = 0.665$ to $r_s = 1.000$; $p < 0.001$.

Conclusion: The histogram can be considered an image method to better identify echotextural damages.

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Table 1. Concordance Correlation Coefficient (CCC) and Intraclass Correlation Coefficient (ICC):

Evaluators	GS - CCC (IC 95%)	p-value	Histogram (IC 95%)	p-value
1 e 2	0,998 (0,994-0,999)	<0,001	0,999 (0,995-1,000)	<0,001
1 e 3	0,998 (0,995-0,999)	<0,001	0,999 (0,995-1,000)	<0,001
2 e 3	0,992 (0,980-0,997)	<0,01	0,996 (0,979-0,999)	<0,01
Standard by US 2D	ICC		p-value	
GS	0,997(0,992-0,999)		<0,001	
Histogram	0,998(0,992-0,999)		<0,001	

Legends: Gray Scale (GS).

Figure 1. Patient with gout: A and B: Tophi area measures (star) in right metatarsos and effusion (arrow) by GS (45 mm²) and histogram (39 mm²), respectively.

Disclosure of Interests: José Alexandre Mendonça Speakers bureau: Novartis, Janssen, Bristol, UCB, Isabella Siste de Almeida Aoki: None declared, Caique Chagas Cavuto: None declared, Vânia Aparecida Leandro-Merhi: None declared, José Luis Braga de Aquino: None declared
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AB0799

DO WE OVERDIAGNOSE SERONEGATIVE RHEUMATOID ARTHRITIS? – THE ROLE OF MUSCULOSKELETAL ULTRASOUND IN CLARIFYING SERONEGATIVE INFLAMMATORY ARTHRITIS

D. Esperança Almeida¹, E. Costa¹, F. Guimarães², A. S. Pinto³, H. Parente², S. Azevedo², J. Rodrigues², J. Tavares-Costa², C. Afonso², D. Faria², M. Cerqueira¹, F. Teixeira². ¹Hospital de Braga, Serviço de Reumatologia, Braga, Portugal; ²Unidade Local de Saúde do Alto Minho, Serviço de Reumatologia, Ponte de Lima, Portugal; ³Unidade Local de Saúde da Guarda, Serviço de Reumatologia, Guarda, Portugal

Background: Several data indicate that seronegative rheumatoid arthritis (RA-) and seropositive RA (RA+) may have different mechanisms and prognosis, being well established that rheumatoid factor (RF) and anti-citrullinated peptide antibodies (ACPA) have diagnostic and prognostic value. Several conditions, like peripheral spondyloarthritis (SpA), psoriatic arthritis or crystal-related arthropathies may mimic the presentation of RA. Mechanisms and treatment of each of these conditions differ significantly. The authors speculate that RA- may be overdiagnosed in the setting of seronegative chronic inflammatory arthritis and that musculoskeletal ultrasound (US) may help us to better classify these patients through the identification of characteristic lesions of the mentioned diseases.

Objectives: To compare the frequency of US lesions found in joints and entheses between RA- and RA+ patients.

Methods: Cross-sectional study: systematic US evaluation of ten joints, twelve entheses and both flexor and extensor tendons of four fingers (Table 1) in consecutive RA- patients. RA+ patients matched for sex and age were recruited. RA- patients included met every of the following criteria: history of chronic polyarthritis, RF and ACPA negativity, no extra-articular features of SpA or RA nor family history of SpA, no suspected crystal-related arthritis.

Results: Twenty-one RA- patients were included and twenty RA+ patients were recruited as controls. No differences between groups were found in sex, age, body mass index, time of disease evolution or use of biological therapy. RA- patients had a significantly higher number of enthesal structural and/or inflammatory lesions than RA+ patients (median 2.0 vs. 0.5, U 111.5, $p=.008^{**}$), with triceps enthesitis being significantly more frequent in RA- patients ($p=.036^{*}$). In total, 18.7% of RA- entheses had enthesitis lesions vs. only 8.3% of RA+ entheses. One RA- patient had ultrasonographic features of dactylitis which was not clinically evident.

As expected, considering the role of RF and ACPA in erosive RA, RA- patients had a significantly lower number of joints with erosions compared to RA+ patients (median 0.0 vs. 3.0, U 64.5, $p<.001^{***}$), with significant differences in every considered joint. Erosions were found in 6.7% of RA- joints vs. 32.0% RA+ joints. Additionally, two RA- patients had hyperechogenic foci in knee cartilage or carpal fibrocartilage suggestive of calcium pyrophosphate deposition.

Table 1. Comparative frequency of ultrasound lesions found in joints and entheses of RA- and RA+ patients.

	RA- (n=21)	RA+ (n=20)	p-value
Mdn number of ENTHESES with any lesion per patient $\pm$ IQR	2.0 $\pm$ 3.0	0.5 $\pm$ 2.0	.008**
Triceps – n (%)	8 (38.1%)	2 (10.0%)	.036*
Quadriceps – n (%)	9 (42.9%)	6 (30.0%)	.393
Superior patellar – n (%)	4 (19.0%)	1 (5.0%)	.169
Inferior patellar – n (%)	-	-	-
Achilles – n (%)	9 (42.8%)	4 (20.0%)	.116
Plantar fascia – n (%)	5 (23.8%)	1 (5.0%)	.089
DACTYLITIS – 2 nd + 5 th finger – n (%)	1 (4.8%)	-	-
Mdn number of joints with EROSIONS per patient $\pm$ IQR	0.0 $\pm$ 1.0	3.0 $\pm$ 3.0	<.001***
Ulnar styloid process – n (%)	5 (23.8%)	11 (55.0%)	.041*
Metacarpophalangeal 2 – n (%)	3 (14.3%)	11 (55.0%)	.006**
Metacarpophalangeal 5 – n (%)	1 (4.8%)	10 (50.0%)	.001**
Metatarsophalangeal 1 – n (%)	-	3 (15.0%)	-
Metatarsophalangeal 5 – n (%)	3 (14.3%)	11 (55.0%)	.006**
CHONDROCALCINOSIS – triangular fibrocartilage + knee – n (%)	2 (9.5%)	-	-
DOUBLE CONTOUR – any joint – n (%)	-	-	-

RA- – seronegative rheumatoid arthritis; RA+ – seropositive rheumatoid arthritis Mdn – median; IQR – interquartile range; n (%) – absolute number (percentage) of patients with the indicated lesion.

Conclusion: We found that some patients diagnosed with RA- had, in fact, ultrasonographic features of different diseases, namely enthesitis/dactylitis and crystal deposition. These data suggest that RA- may be overdiagnosed in clinical practice. Systematic US evaluation of joints and entheses may provide valuable diagnostic information in patients with chronic inflammatory seronegative arthritis and improve patient care.

Disclosure of Interests: None declared

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AB0800

HEMATOLOGICAL MARKERS OF SYSTEMIC INFLAMMATION IN PATIENTS RHEUMATOID ARTHRITIS (RA) AND SPONDYLOARTHRITIS (SPA)

B. Targonska-Stepniak¹, K. Grzechnik², M. Majdan¹. ¹Medical University of Lublin, Rheumatology and Connective Tissue Diseases, Lublin, Poland; ²Samodzielny Publiczny Szpital Kliniczny nr 4, Rheumatology and Connective Tissue Diseases, Lublin, Poland

Background: An appropriate assessment of disease activity is essential in the management of patients with chronic inflammatory joint diseases, rheumatoid arthritis (RA) and spondyloarthritis (SpA). Hematological parameters [Neutrophil-To-Lymphocyte (NLR), Platelet-To-Lymphocyte (PLR) and Monocyte-To-Lymphocyte (MLR) ratios] have been demonstrated to be good, promising indicators of systemic inflammation status in different diseases, additionally to conventional inflammatory markers [erythrocyte sedimentation rate (ESR), C-reactive protein (CRP)]. However results remain conflicting in rheumatic patients.

Objectives: The goal of the study was to determine the role of NLR, PLR, MLR in assessing inflammatory disease activity and to compare the biomarkers in RA and SpA patients.

Methods: An observational study was conducted in patients with RA and SpA (ankylosing spondylitis and psoriatic arthritis) treated in the Department of Rheumatology and Connective Tissue Diseases, Medical University of Lublin, Poland. Demographic and clinical information was obtained through structured interview, review of medical records and laboratory tests. The following disease activity and functional scores were registered: CRP and ESR levels, swollen and tender joints counts (SJC, TJC), DAS28 (ESR), HAQ, BASDAI, BASFI, patient global assessment (PtGA) and physician global assessment (PGA) rated on a visual analogue scale (VAS).

The study group consisted of 95 patients (58 women, 37 men), with the mean (SD) age 45.4 (9.9), disease duration 10.0 (8.4) years. There were 58 (61.1%) patients with RA (44 women, 14 men) and 37 (38.9%) patients with SpA. The mean age and disease duration were statistically not different in both patients' groups. The mean (SD) DAS28 was 4.21 (1.8) in RA patients; in SpA patients BASDAI 4.9 (2.6) and BASFI 5.0 (2.8).

Results: In the whole group (95 patients) and in the SpA group, we found positive correlations between the PLR value and the following parameters CRP, ESR; between NLR and CRP, ESR; between MLR and CRP. In the RA group positive correlations were observed between PLR and CRP, ESR; NLR and CRP; MLR did not correlate with CRP and ESR.

In RA patients, there were statistically significant correlations between values of PLR and DAS28 ($r=0.356$, $p=0.006$), TJC ($r=0.308$, $p=0.02$), SJC ($r=0.318$, $p=0.016$), PtGA ($r=0.372$, $p=0.008$). No significant correlation was found between NLR, MLR and other disease activity scores.

In SpA patients, we found a significant correlation between NLR and PtGA ($r=0.488$, $p=0.04$). No significant correlations were found between NLR, PLR, MLR and BASDAI, BASFI.

The group of RA patients as compared with SpA, was characterized by significantly higher value of PLR [respectively 207.8 (94.0) vs 169.9 (77.7), $p=0.04$]. In turn, SpA patients compared with RA, were characterized by unfavorable metabolic parameters: higher atherogenic index [respectively 4.03 (0.8) vs 3.57 (1.1), $p=0.03$], lower HDL-cholesterol [47.4 (10.7) vs 56.1 (16.4) mg/dl ($p=0.006$); higher serum uric acid [5.6 (1.2) vs 4.5 (1.4) mg/dl ($p=0.0001$)], higher waist measurement [96.1 (14.2) vs 85.9 (11.5) cm ($p=0.0003$).

Conclusion: In our study we found, that in patients with RA, PLR was associated with both clinical and inflammatory markers of disease activity; in SpA patients NLR, PLR and MLR were associated with conventional inflammatory markers (CRP, ESR). Hematological inflammatory biomarkers may reflect disease activity and could represent potential parameters to evaluate disease activity not only in RA, but also in SpA.

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