GS:1.0, DP:0.8, DAS28:0.9 and SJC:1.0). The average time required to score one patient was 140 s.

Abstract AB1202 – Figure 1. Scatterplot for FOI and US changes sum score and 4 patient averages trendlines

Conclusions: This study shows a significant correlation and corresponding trendlines between FOI and US for change over time, and good responsiveness using the new FOI scoring system. FOI may therefore be used as an alternative to known imaging modalities for monitoring RA patients in clinical trials, and potentially in the daily clinical practice.

Disclosure of Interest: None declared

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AB1203

USE OF MAGNETIC RESONANCE IMAGING OF THE PELVIS TO DESCRIBE INFLAMMATORY CHANGES AT DIFFERENT ANATOMIC SITES IN THE PELVIS WHICH ARE POTENTIALLY SPECIFIC FINDINGS IN PATIENTS WITH POLYMYALGIA RHEUMATICA

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Background: Pelvic girdle pain is a common clinical symptom of patients with polymyalgia rheumatica (PMR). It also occurs in patients with rheumatoid arthritis (RA). The origin of this characteristic pain is not really clear, even though some imaging findings have been reported. However, this has neither changed pathophysiological thinking nor clinical practice related to diagnosis.

Objectives: To describe pelvic structures in PMR patients in detail which show signs of inflammation by magnetic resonance imaging (MRI) in order to find a disease specific pattern.

Methods: In a retrospective study we used MRIs of patients who had presented with clinical symptoms suggestive of PMR in our centre between 2015 and 2017. Only patients with complete MRI examinations, including contrast enhanced scans in coronal and transversal planes were included to be carefully examined by an experienced musculoskeletal radiologist (MF). After having first described all findings in much detail we developed a preliminary semiquantitative scoring system that assesses a total of 12 sites which appeared to be frequently involved. A total of 40 patients with pelvic girdle pain and complete data were identified from the hospital records. The median (25th/75th percentiles) age of the patients was 67 (55/73) years, the median symptom duration was 13 (6/22) weeks, 55% were female, the median C-reactive protein measured close to the day of the MRI examination was 1.9 (0.7/4) mg/dl, and the median erythrocyte sedimentation rate was 30 (17/43) after the 1st hour. Only 3 patients were rheumatoid factor positive, and 2 patients had anti-CCP antibodies. Ten patients had a diagnosis of RA (25%) in addition to the leading PMR like symptom.

Results: The MRI signal of interest for PMR is a post-gadolinium signal in T1 weighted pelvic images. The most frequently involved anatomic sites were: the hamstring tendon and the M.gluteus medius and minimus tendon near the greater trochanter in all cases, which were found to be bilaterally involved as was the proximal M.rectus femoris in all cases, and the insertion of the adductor muscles, especially the M.adductor longus at the inferomedial pubic symphysis in 90% of cases. Other sites were also, but less frequently, involved. We think that the involvement of 4 sites including either the M.rectus femoris or the M.adductor

longus is rather specific for PMR, see exemplary images below. There was no major difference between patients with and without RA.

Abstract AB1203 – Figure 1

Conclusions: This study suggests that there may be a MRI pattern specific for PMR. The target structure of the characteristically inflamed anatomic site seems to be the paratenon which implies that the pattern observed in PMR differs from the enthesitis seen in patients with spondyloarthritis. Prospective randomised trials are needed to further test and prove the clinical usefulness of this approach.

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AB1204

QUANTITATIVE MRI AND DYNAMOMETERS CAN DISTINGUISH MYOSITIS FROM HEALTHY CONTROL MUSCLE

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Background: Myositis is an autoimmune disease which can decrease quality of life and increase mortality. Clinical presentation includes muscle weakness, changes in muscle microstructure, myosteatosis, raised muscle enzymes and myalgia. Diagnosis is reliant on subjective clinical examinations, blood tests and invasive muscle biopsies. Quantitative MRI techniques such as diffusion tensor imaging (DTI) and fat fraction (FF) measurements offer non-invasive measurements, which could improve the understanding of muscle pathology and potentially inform diagnosis. DTI measures water diffusion within tissues which is sensitive to changes in muscle microstructure⁽¹⁾. FF provides a quantitative measure of myosteatosis in muscles⁽²⁾. The use of these techniques could provide new imaging biomarkers in the diagnosis and management of myositis.

Objectives: To evaluate whether fat fraction, mean diffusivity and dynamometer measurements are sensitive enough to detect muscle differences in myositis patients compared to healthy controls.

Methods: 10 active myositis patients (6 female, mean age 55±18) diagnosed according to the Bohan and Peter myositis criteria (mean CK 2,015±10,787) and 16 healthy controls (10 female, mean age 44±17), were imaged using STEAM-EPI diffusion and 2-point Dixon to obtain FF measurements. Myositis patients included 5 polymyositis, 3 dermatomyositis and 2 inclusion body myositis. Mean measurements of FF and mean diffusivity (MD) were obtained from regions drawn manually within the individual muscles of the quadriceps and hamstrings (image 1). No distinction was made between affected and unaffected muscles. In addition to MRI, all participants had knee extension and flexion power and torque measured on an isokinetic dynamometer and handgrip measurements on an isometric dynamometer. Differences were assessed using independent T-tests.

Results: FF and diffusion measurements were higher in myositis patients compared to healthy controls, whereas muscle power and torque were reduced (table 1). These results were consistent across both quadriceps and hamstrings.

Abstract AB1204 – Table 1

		Mean		Mean difference (95% CI)		Significance (p value)	
		Hams	Quads	Hams	Quads	Hams	Quads
FF (%)	Myositis	15.09 (-9.21, 39.39)	14.33 (-16.95, 45.6)	10.08 (5.12-15.05)	11.2 (5.79-16.61)	<0.001	<0.001
	Healthy	5.0 (-4.89, 14.82)	3.13 (-0.28, 6.54)				

MD (x10- 3mm ² /s-1)	Myositis	1.31 (1.15- 1.47)	1.26 (1.05- 1.47)	0.087 (0.00- 0.17)	0.02 (-0.05, 0.09)	0.046	0.02
	Healthy	1.22 (0.69- 1.75)	1.23 (0.75- 1.72)				
Leg power (Watts)	Myositis	34.92 (-14.42, 84.25)	58.2 (-29.39, 145.77)	-25.05 (-43.71,- 6.39)	-47.53 (-92.14,- 12.92)	0.011	0.010
	Healthy	59.97 (18.88- 101.07)	105.72 (18.48- 192.96)				
Leg torque (N m)	Myositis	19.66 (-16.29, 55.62)	30.45 (-27.47, 88.36)	-18.01 (-31.7,- 4.33)	-33.36 (-56.12,- 10.57)	0.013	0.006
	Healthy	37.68 (6.8- 68.55)	63.80 (6.98- 120.63)				
		Mean	Mean difference (95% CI)	Significance (p value)			
Handgrip (kg)	Myositis	15.6 (-0.05, 31.25)	-18.74	<0.001			
	Healthy	34.34 (14.94-53.73)	(-25.4,-12.1)

Abstract AB1205 – Figure 1

a) Sagittal (localiser) image of the thigh used in the planning of the Vibe-Dixon imaging volume (shown by the box). b) Regions of interest were drawn corresponding to the individual muscles of the thigh. c) Stimulated echo acquisition mode-Echo planar imaging (STEAM-EPI) diffusion image

Conclusions: MRI based FF and DTI measurements and dynamometer measurements can detect muscle differences between myositis and healthy control groups. These differences are consistent with increased myosteatosis, increased oedema and the effects of muscle fibre plasticity. These measures show potential as novel imaging biomarkers in the diagnosis and management of myositis.

REFERENCES:

- [1] Qi, et al. Journal of magnetic resonance imaging. 2008
- [2] Willis, et al. 2013

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AB1205 **PRECISION OF SERUM AND PLASMA TESTING IN ANTI-CARDIOLIPIN AND ANTI-B2 GLYCOPROTEIN-1 ANTIBODIES**

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Background: Anti-cardiolipin (aCL) and anti-β2 glycoprotein-1 (β2GP1) antibody ELISA testing may be performed on serum, plasma, or both in accordance to the manufacturers' suggested protocols. There exists some variability in manufacturers' preference for serum or plasma. Various societal guidelines have published a preference for serum over plasma; however, there is scarcity of data assessing reproducibility between serum and plasma in aCL or β2GP1 testing.

Objectives: To determine reproducibility of aCL and β2GP1 testing between serum and plasma samples obtained in a routine clinical setting.

Methods: Patients with clinical serum draws for IgG/IgM aCL and β2GP1 antibodies were identified, and same-day, citrated plasma samples were obtained for repeat ELISA testing (QUANTA Lite, INOVA Diagnostics, San Diego, CA). Quantitative levels were determined for each isotype and further stratified into Negative (<15.0 GPL/MPL or U/mL), Weakly Positive (15.0–39.9 GPL/MPL or U/mL), or Positive (≥40.0 GPL/MPL or U/mL) reference categories. Differences were

compared using paired t-tests. Agreement between the reference categories were compared by kappa coefficients.

Results: Fifty patients were identified for study with 50 and 40 samples eligible for repeat aCL and β2GP1 plasma testing, respectively. Mean age was 49±18 years. 70% were female, 86% were Caucasian, 22% with systemic lupus erythematosus and 22% with antiphospholipid syndrome. As shown in Table 1, quantitative levels tended to be slightly higher in serum than plasma. Although a statistically significant difference was found for most of the antibodies tested, the difference between serum and plasma values were generally small. There was good agreement in reference category between serum and plasma. Kappa coefficients ranged from 0.70 to 1.00.

Abstract AB1205 – Table 1. – Reproducibility of anti-Cardiolipin and anti-β2 Glycoprotein-1 Testing in Serum versus Plasma

	Quantitative Levels		Agreement to Reference Category	
	N Samples	Mean Difference (sd) ¹	p-value	κ Coefficient (95% CI)
IgG aCL	50	0.4 (14.8) GPL	0.84	0.81 (0.64–0.98)
IgM aCL	50	3.3 (8.5) MPL	0.008	0.73 (0.56–0.91)
IgG	40	1.4 (4.2) U/mL	0.038	1.00 (1.00–1.00)
β2GP1				
IgM	40	4.6 (8.9) U/mL	0.002	0.74 (0.54–0.94)
β2GP1				

1: Serum-Plasma. **Abbreviations:** aCL=anti cardiolipin, β2GP1=anti-β2 glycoprotein 1, sd=standard deviation

Conclusions: There appears good reproducibility of IgG/IgM aCL and β2GP1 antibody ELISA results between serum and plasma.

REFERENCES:

- [1] Lakos G, Favaloro EJ, Pierangeli SS, et al. Arthritis & Rheumatology. 2012 Jan 1;64(1):1–0.
- [2] Lewis DA, Pound ML, Ortel TL. Journal of Thrombosis and Haemostasis. 2006 Jan 1;4(1):265–7.
- [3] Wong RC, Favaloro EJ, Mallon D, et al. Pathology. 2008 Jan 1;40(1):58–63.
- [4] Wong RC, Gillis D, Sturgess A, et al. Pathology. 2004 Feb 1;36(1):63–8.

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AB1206 **DYNAMIC CONTRAST ENHANCED (DCE)-MRI IN RELATION TO INFLAMMATORY MARKERS IN SERUM AND JOINT FLUID: INITIAL DATA AND VALIDATION IN FOUR MOST COMMON KNEE ARTHRITIC DISEASES**

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Background: Biomarker science has advanced to aid in distinguishing between different forms of arthritis: inflammatory arthritides such as rheumatoid arthritis (RA) and psoriatic arthritis (PsA) and osteoarthritis (OA). Biomarkers are also used to assess disease activity. Diagnostic serum biomarkers such as rheumatoid factor (RF) and cyclic-citrullinated peptide (CCP) and assays of disease activity such as C-reactive protein (CRP), and multi-biomarker assays have utility but lack complete sensitivity and specificity. Increasingly quantitative imaging biomarkers may fill an important gap in disease identification and assessment.

Objectives: 1) To investigate the association between imaging measures of inflammation in the synovium of the knee joint and systemic levels of CRP in patients with RA, PsA and OA. 2) Investigate how imaging and clinical markers correlate to IL-6 levels from joint fluid in different patient cohorts.

Methods: 38 patients with a flare of pain in the knee were recruited. 12 were diagnosed with RF positive (+) RA, 6 with RF negative (-) RA, 6 PsA, and 14 OA, according to ACR/EULAR criteria. CRP in blood and IL-6 levels from joint fluid were determined. Patients underwent MRI, including Dynamic Contrast Enhanced (DCE)-MRI exam prior to an ultrasound-guided arthrocentesis.

MRI were scored for synovitis¹ and DCE-MRI were quantified using Dynamic Enhanced MRI Quantification (DEMRIQ) method, extracting the volume of enhancing voxels (Nvoxel), Initial Rate of Enhancement (IRE), Maximum Enhancement (ME). Inflammation was quantified as IRExNvoxels and