Figure 1. Changes in Gd delay between pre-contrast image and post-contrast image measured in all images using automated workflow of DICOM header checks
Abbreviations: DICOM, Digital Imaging and Communications in Medicine; Gd, gadolinium; MCP, metacarpophalangeal

Figure 2. Distribution of the delay from Gd injection to scan acquisition for all post-contrast magnetic resonance images
The number of series with a Gd delay greater than Q3+1.5-IQR (outliers with a significantly longer than expected Gd delay) was 11 (3%) for the MCP series and 17 (4%) for the wrist series.
Abbreviations: IQR, interquartile range; MCP, metacarpophalangeal; SD, standard deviation

Disclosure of Interests:

Mikael Boesen Consultant of: AbbVie, AstraZeneca, Eli Lilly, Esaote, Glenmark, Novartis, Pfizer, UCB, Paid instructor for: IAG, Image Analysis Group, AbbVie, Eli Lilly, AstraZeneca, esaote, Glenmark, Novartis, Pfizer, UCB (scientific advisor)., Speakers bureau: Eli Lilly, Esaote, Novartis, Pfizer, UCB, Mark Hinton: None declared, Javier Gonzalez-Zabaleta: None declared, Scott Beattie Shareholder of: Eli Lilly and Company, Employee of: Eli Lilly and Company, Douglas Schlichting Shareholder of: Eli Lilly and Company, Employee of: Eli Lilly and Company, Terence Rooney Shareholder of: Eli Lilly and Company, Employee of: Eli Lilly and Company, Olga Kubassova Shareholder of: IAG, Image Analysis Group, Consultant of: Novartis, Takeda, Lilly, Employee of: IAG, Image Analysis Group
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THU0520

DIFFUSE ENTHESITIS AND LOW-GRADE INFLAMMATION IN PATIENTS WITH METABOLIC SYNDROME: A CLINICAL AND ULTRASOUND STUDY.

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Background: Metabolic syndrome (MS) is a clinical condition characterized by central obesity and additional factors such as dyslipidemia, hypertension, raised fasting plasma. Scanty observations describe the association of MS with musculoskeletal conditions, such as enthesopathies and diffuse idiopathic hyperostosis syndrome (DISH). Musculoskeletal ultrasound (US) has been applied to the study of entheses, but the real prevalence and characteristics of enthesal involvement in MS has yet to be clarified.

Objectives: The aim of our work was to study the US-defined enthesal changes in MS, to correlate the US enthesitis scores to clinical characteristics, and to define a relation between MS-related enthesitis and the presence of concurrent DISH

Methods: Sixty consecutive outpatients (24 males, 36 females, mean age 60 years), all fulfilling International Diabetes Foundation (IDF) criteria for MS, were also evaluated with multi-site bilateral US enthesal examination. Each patient underwent power Doppler (PD) US examination of twelve enthesal sites, using Esaote MyLab Twice with 6–18 MHz transducer. Enthesitis was defined on the basis of OMERACT's filter. Inflammatory and structural changes were scored as a whole when present (score 1) or absent (score 0). The sum of entheses with inflammatory and structural damage was defined as "global inflammatory score" (GIs) and "global structural damage score" (GSDs) for each patient. The Leeds Enthesitis Index (LEI) was also applied, and a spinal radiography was obtained for each patient to research concurrent signs of DISH satisfying Resnick and Niwayama criteria.

Results: Patients showed moderate overweight (mean BMI 29) and a diagnosis of type 2 diabetes was present in 24 (40%). A low-grade inflammatory state was demonstrated in MS (mean CRP 0.58 mg/dL, mean ESR 21.9 mm/h). A high prevalence of US-defined enthesitis was noted in 52 patients (86%) and 127/720 entheses (17.6%). PD signals, were reported in 11 patients (18%) and 11/720 entheses (1.52%), and they were associated to clinical symptoms expressed as LEI (p=0.0138). Erosions, although rare (0.3% of entheses), were more frequent in males (p= 0.001). Moreover, in 57 patients (95%) and 217 entheses (30%) structural damages were found. A correlation was found between GIs and GSDs and both BMI (p=0.0233 and p=0.0068 respectively), LEI (p=0.03 and p=0.0099

respectively), and type 2 diabetes (p=0.0248 and p=0.0156 respectively). In 28 patients (46%) a concurrent diagnosis of DISH was made. In multivariate regression analysis the best predictors for DISH were higher levels of CRP (p=0.038) and older age (p<0.0001). DISH correlated with older age (p<0.0001), CRP and ESR (p= 0.0428 p=0.0069 respectively) and US global scores for enthesitis (p=0.0312 for GIs, p=0.0071 for GSDs).

Conclusion: This is the first study where diffuse enthesitis and enthesal structural damage are demonstrated with high prevalences in MS, comparable or also higher than those reported for SpA-related enthesitis. Our data, obtained using the most recent OMERACT's definition for US-detected enthesitis (proposed for SpA), also suggest a low specificity of this definition, in consideration of the high prevalence of MS-associated enthesitis. Moreover PD was associated to enthesal pain expressed as LEI. Both GIs and GSDs showed a correlation with overweight and type 2 diabetes. As secondary result, this study demonstrated that almost half of patients with MS could have a concurrent diagnosis of DISH. Patients with DISH were older, with higher levels of inflammation, and higher scores of US-defined enthesitis. Our results suggest that MS and DISH could be strictly related; diffuse enthesitis with a low-grade inflammatory state should be regarded as potential factor of progression from MS towards a conformed DISH.

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THU0521

EVALUATION OF LIVER FIBROSIS IN PATIENTS WITH RHEUMATOID ARTHRITIS UNDER METHOTREXATE TREATMENT. UTILITY OF FIBROSCAN AND BIOMARKERS IN ROUTINE CLINICAL PRACTICE.

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Background: Despite therapeutic advances in recent years, methotrexate (MTX) remains the gold standard for the treatment of rheumatoid arthritis (RA). Among the side effects that have been blamed on it are liver fibrosis (LF) and cirrhosis, although late studies have failed to show such a relation^{1,2}. The only validated test in the diagnosis of LF is biopsy. Given the relevance of MTX in the treatment of RA, it is important to evaluate non-invasive diagnostic options for LF such as transitional elastography (FibroScan, FS).

Objectives: To evaluate the percentage of LF in RA patients treated with MTX. Secondly, to assess the correlation between altered liver function, RA activity, and LF. To determine whether dose and/or duration of treatment with MTX may affect the development of LF in such patients.

Methods: We did a prospective study between February 2019 and January 2020. Patients affected of RA treated with MTX were included. Patients with basal liver disease (hepatitis B, hepatitis C and steatohepatitis), alcohol consumption, type I diabetes mellitus, chronic renal failure, heart failure, obesity and concomitant treatment with leflunomide or antiretrovirals were excluded. Demographic, clinical, analytical and therapeutic variables were collected. Liver fibrosis was assessed by FS in kilopascals (kpa) and using the APRI score. RA activity was assessed by DAS28 score. Continuous variables are described with mean and standard deviation (SD), and qualitative variables are shown with absolute value and percentage. Spearman's and Mann-Whitney's U tests were used for the bivariate analysis.

Results: Fifty patients were included (Table 1 and 2). Of these, 38 were women (76%) with mean age of 61.8 years (SD 11.7) and mean RA evolution time of 13.7 years (SD 8.2). The mean DAS28 at the visit was 2.39 (SD 1.1). The FS showed an average of 4.8 kpa (SD 2). The mean duration of treatment with MTX was 85.8 months (SD 93.3) and that of AD-MTX was 5414.6mg (SD 5011). Patients were divided into those with DA-MTX greater than 4000mg (21, 42%) and less than 4000mg (29, 58%) and no significant differences were found in terms of LF in FS (p 0.637) or APRI scale (p 0.806). No significant differences were found in terms of treatment duration either. Six patients (12%) had elevated aspartate aminotransferase (AST) and 9 (18%) had elevated alanine aminotransferase (ALT). No significant difference was found in FS values in relation to ALT, but it was with elevated AST (p 0.021). Similarly, differences were found in APRI based on AST (p 0.045). Metabolic syndrome was collected in 4 patients (8%) without significant differences with FS or APRI values. There were no significant differences in LF depending on gamma-glutamyl transpeptidase (GGT) values.

Conclusion: FS and APRI score are useful for the determination of LF in RA patients treated with MTX. There is no evidence of a relationship between AD-MTX and LF by FS or APRI. AST values may be related to the presence of fibrosis as determined by FS or APRI. and the presence of the metabolic syndrome are not.

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THU0522

DIFFERENCES IN MUSCLE PROPERTIES IN GCA PATIENTS COMPARED TO HEALTHY CONTROLS AS ASSESSED BY QUANTITATIVE MRI

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Background: Giant cell arteritis (GCA) is a systemic inflammatory vasculitis that often presents with headaches and visual symptoms. It is a medical emergency as it can lead to permanent sight loss. Prompt treatment with high doses of glucocorticoid therapy are often required. However, it has been shown that GCA patients on glucocorticoid therapy develop muscle weakness, known as glucocorticoid induced myopathy (1).

Quantitative MRI may be sensitive to detect the differences in muscle parameters between newly diagnosed GCA patients compared to healthy controls. MRI T2 is sensitive to fluid related to physiological changes at the molecular level, and is regarded as an indirect measure of muscle inflammation (2). MRI muscle fat fraction (FF) is useful for identifying myosteatosis (3). Diffusion tensor imaging (DTI) is sensitive to changes in muscle microstructure and may be useful in identifying changes to muscle fibres (4).

Objectives: To obtain preliminary estimates of the extent to which quantitative MRI-based measurements of muscle T2, FF, DTI and volume differ between newly diagnosed GCA patients and healthy controls (HC) and how the muscle changes over 3- and 6-month intervals following glucocorticoid therapy.

Methods: MRI of the mid-thigh were acquired using Dixon imaging to assess FF, Stimulated Echo Acquisition Mode echo planar imaging (STEAM-EPI) to measure diffusion, and a fat-suppressed multi-echo spin-echo to measure T2. Regions of interest were drawn around the quadriceps and hamstrings. All participants had knee extension and flexion torque measured on an isokinetic dynamometer, and isometric dynamometer to measure grip strength.

Results: 20 GCA patients (68.2±8.3 years, 14/20 female, mean ESR 26.9mm/h, mean CRP 39.6mg/L) were enrolled within 14 days of starting glucocorticoids: 15 returned at 3 months (mean ESR 17mm/h, mean CRP 5.7mg/L); 8 returned at 6 months (mean ESR 18mm/h, mean CRP 6mg/L). 20 directly age- and gender-matched HC also were recruited. T2 and FF were higher and muscle volume lower in the GCA patients at baseline compared to HC (fig. 1 and 2). Within the hamstrings, the mean differences between GCA patients and HC for T2, FF and muscle volume were 2.2ms (95% CI 1, 4; p=0.09), 3.8% (95% CI 2, 5; p<0.001), and -166cm³ (95% CI 110, 210; p<0.001) respectively. There was no substantive difference in mean diffusivity or fractional anisotropy. Results in the quadriceps followed a similar trend. Following glucocorticoid treatment, there were no substantive changes in MRI measurements. Knee flexion/extension and handgrip strength were lower in the GCA patients at baseline compared to HC, with differences of -5.3Nm (95% CI -32.6, -7.4; p=0.003) and -4.4Nm (95% CI -56.7, -1.3; p=0.04) for flexion and extension respectively. Muscle strength did not change following glucocorticoid treatment.

Figure 1. Quantitative MRI measurements of GCA patients and healthy controls in the hamstrings.

Conclusion: This pilot study suggests for the first time that muscle health may be affected in newly diagnosed GCA patients compared to age and gender matched HC, as demonstrated by higher T2 and FF, and lower muscle volume and muscle strength. These preliminary results show that muscle changes may occur in the early stages of GCA and persist throughout the disease duration. If these findings are confirmed, it will be important to consider interventions to improve muscle health in the treatment pathway for GCA.

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Figure 2. Quantitative muscle volume and muscle strength measurements of GCA patients and healthy controls.

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CLINICAL UTILITY OF TESTING CONVENTIONAL AND NON-CONVENTIONAL ANTI-PHOSPHOLIPID ANTIBODIES IN SUSPECTED OBSTETRIC ANTI-PHOSPHOLIPID SYNDROME

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Background: Anti-phospholipid syndrome (APS) is an important cause for recurrent pregnancy losses (RPL). Conventional APS antibodies (aPLs) like lupus anti-coagulant (LA), anti-cardiolipin (ACL) and anti-beta 2 glycoprotein I (anti-β2 GP I) are not present in significant number of obstetric APS (OAPS) patients, leading to a state described as “sero-negative” OAPS (SNOAPS). Recent literature shows non-conventional aPLs like Anti phosphatidylserine-prothrombin complex (Anti-PSPT) and Anti-Annexin V (Anti-Ann V) can be positive in up to 50% of SNOAPS patients

Objectives: Testing the performance of conventional and non-conventional aPLs in suspected OAPS patients (obstetric events as defined in the Sydney classification criteria for APS)

Methods: We performed a retrospective chart review of 101 patients who underwent combined testing for non-conventional aPLs for suspected OAPS from May 2016 to November 2019 at our department. Patients were categorized into OAPS cases (n=50, median age 31 years) and controls (n=51, median age 30 years) based on their fulfillment of clinical definition of OAPS events defined by Sydney criteria. Conventional aPLs were tested by methods adapted in Sydney criteria and Anti PSPT /Anti Ann V were tested by commercial ELISA. The sample size (n=101) has 95% confidence interval with a margin of error of 10% for the objective of the study.