Objectives: To inform a EULAR taskforce on the current literature on different imaging techniques, procedures and materials to guide interventions on musculoskeletal sites in RMD patients.

Methods: Prospective and retrospective studies published in English and comparing either palpation or imaging guided interventions in patients with RMDs were included. MEDLINE, EMBASE, the Cochrane Library and Epistemonikos were searched through October 2021. Risk of bias (RoB) was assessed using the Cochrane RoB tool for randomized trials version 2 (ROB2), the RoB tool for Non-Randomized Studies of Interventions (ROBINS-I) and the appraisal tool for cross-sectional studies (AXIS).

Results: Sixty-six studies, with moderate to high RoB, consisting of 49 randomized controlled trials, three prospective cohort studies and 14 retrospective studies were included.

Fifty-one studies compared one imaging technique against either another imaging technique, or palpation-guided interventions. Most of the studies were on peripheral joints (47/51), while data on joints of the axial skeleton were scarce and heterogeneous (4/51). For peripheral joints, ultrasound (US) was the most studied imaging technique (49/51), followed by fluoroscopy (10/51). Results revealed a higher accuracy and safety (including procedural pain) of US or fluoroscopy compared to palpation-guided interventions. Data on other imaging techniques was scarce (computed tomography: n=3, arthroscopy: n=1) and the results heterogeneous. Results of studies comparing different imaging techniques (12/51) did not favor one imaging method over another.

Three studies comparing different materials used for imaging guided interventions were found (e.g. automatic vs manual syringes), showing little evidence for one material being superior to another one.

Fifteen studies were found comparing different imaging guided procedures (e.g. intraarticular vs periarticular injections). Overall, studies indicated an advantage of targeted vs. not targeted interventions (intraarticular vs periarticular or intraepineurial vs extraepineurial injections) concerning pain levels, while the comparison of different puncture sites to inject (e.g. ulnar vs midline carpal tunnel injection) was inconclusive.

Conclusion: Imaging guidance, especially US, performs favorably for interventions at the peripheral joints compared to palpation-guided interventions, concerning accuracy and safety. Data for the axial skeleton are scarce. Imaging guided targeted interventions may lead to better outcomes than non-targeted interventions.

Disclosure of Interests: None declared.

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What's new: Latest advances in treatment and care in vasculitis and fibromyalgia

OP0310 GENDER AND FIBROMYALGIA SEVERITY: REAL LIFE DATA FROM THE ITALIAN REGISTRY

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Background: Fibromyalgia (FM) patients report chronic widespread pain, fatigue, cognitive difficulties and sleep disturbances, often associated with anxiety and/or depression (1). FM syndrome more frequently affects women and many papers describe gender-related differences in the perception, description and expression of pain (2), but up to now, the impact of gender on the clinical severity of FM is still a controversial topic.

Objectives: The aim of this study was to analyse the data from a web-based registry of FM patients in order to detect a relationship between gender and disease severity.

Methods: Adult patients with FM, diagnosed on the basis of the 2010/2011 American College of Rheumatology (ACR) diagnostic criteria (3), were recruited at 19 Italian rheumatology centres between November 2018 and April 2019. Those affected by other conditions that could interfere with the assessment of FM, e.g. psychiatric disorders, were excluded from the study. The severity of the disease was evaluated by validated FM-specific questionnaires: the revised Fibromyalgia Impact Questionnaire (FIQR) (4), the modified Fibromyalgia Assessment Status (ModFAS) questionnaire (5), and the Polysymptomatic Distress Scale (PDS) (6). The data obtained were collected in the Italian Fibromyalgia Registry, an online registry created with the support of the Italian Society of Rheumatology (SIR).

Results: We analyse data from 2.381 patients affected by FM, 2.184 females (91.7%) and 197 males. No significant differences in mean age, disease duration, or BMI between the two genders were reported. The women expressed greater disease burden as indicated by higher scores for each completed test: higher mean ModFAS score (25.23 ± 8.83 Vs 23.37 ± 9.22; p = 0.005), mean FIQR score (58.62 ± 23.22 Vs 51.68 ± 23.06; p < 0.001), and mean PDS score (18.77 ± 7.34 Vs 17.19 ± 7.25; p = 0.004). Figure 1 shows the mean scores of each item of the FIQR divided by gender. Women reported significantly higher values on all the items of FIQR except three (feeling overwhelmed, FIQR-11; depression, FIQR-16; and anxiety, FIQR-18). It is interesting to note that men self-reported higher levels of depression (FIQR-16).

Figure 1. Mean scores for each FIQR item by gender.

Conclusion: Our findings demonstrate that women with FM are globally more impaired than men (even if some psychological aspects of the disease are comparable), thus reinforcing the idea that gender plays a role in symptoms and functional impairments associated with the disease.

REFERENCES:

- [1] Clauw DJ. Fibromyalgia: a clinical review. *JAMA*. 2014;311:1547-55.
- [2] Nascimento, et al. Gender role in pain perception and expression: an integrative review. *BrJP*. 2020; 3: 58-62
- [3] Wolfe F, et al. Fibromyalgia criteria and severity scales for clinical and epidemiological studies: A modification of the ACR preliminary diagnostic criteria for fibromyalgia. *J Rheumatol* 2011;38:1113–22.
- [4] Burckhardt CS, et al. The fibromyalgia impact questionnaire: development and validation. *J Rheumatol* 1991;18:728–33.
- [5] Salaffi F, et al. Diagnosis of fibromyalgia: comparison of 2011/2016 ACR and AAPT criteria and validation of the modified Fibromyalgia Assessment Status. *Rheumatol* 2020; 0:1-8.
- [6] Wolfe F, et al. Fibromyalgia prevalence, somatic symptom reporting, and the dimensionality of polysymptomatic distress: results from a survey of the general population. *Arthritis Care Res*. 2013; 65:777–85

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OP0311

THE ROLE OF COMORBID PATHOLOGY IN THE PROGRESSIVE COURSE OF ANCA-ASSOCIATED SYSTEMIC VASCULITIS

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Background: ANCA-associated systemic vasculitis (AAV) is characterized by a high incidence of complications and high damage index. Comorbid pathology at the onset can significantly worsen the prognosis AAV. The most significant comorbid conditions in patients with AAV are coronary artery disease, hypertension and dyslipidemia.

Objectives: The aim of this study was to determine the role of comorbid pathology in the progressive course in patients with AAV.

Methods: Patients with granulomatosis with polyangiitis (GPA), microscopic polyangiitis (MPA) and eosinophilic granulomatosis with polyangiitis (EGPA) were observed during the first 3 years of the disease and included in this study between 2010 and 2018. At the onset of AAV 75% of patients had significant comorbidities (coronary artery disease, hypertension, dyslipidemia, chronic obstructive pulmonary disease, peptic ulcer, diabetes mellitus, autoimmune thyroiditis and others).

Results: In total 209 [165 [79%] female and mean age 51.8 ± 13.2 years) AAV patients (94 GPA; 46 MPA; and 69 EGPA) were included in the analysis. Formation of chronic kidney disease was significantly more frequent in the group of AAV patients with hypertension at the onset, than in patients without hypertension (respectively 37% and 23.6%, p=0.041). Development of thromboembolic complications was significantly more frequent in the group of AAV patients with coronary artery disease at the onset of AAV, than in patients without coronary artery disease (respectively 34% and 14.8%, p=0.034). Dyslipidemia also was risk factor for cardiovascular complications (OR – 3.81, 95% CI (2.43; 8.2) p=0.009). Presence of diabetes mellitus in the AAV onset was risk factor for infectious complications (OR – 1.77, 95% CI (1.14; 3.45) p=0.038).

Conclusion: Our study has shown that comorbid pathology increase risk of serious complications and can significantly worsen the prognosis AAV. Prevention of development of comorbid conditions and control of lipid levels, hypertension levels are necessary to prevent the formation of irreversible organ damage.

Disclosure of Interests: None declared.

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Stress, inflammation & autoimmunity

OP0312

METABOLIC REPROGRAMMING IN MEMORY CD4+ T CELLS IS ASSOCIATED WITH REACTIVE OXYGEN INDUCED IMMUNE CELL DYSFUNCTION DURING AGING

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Background: Inflamm-aging is a chronic, sterile, low-grade inflammatory status, characterized by an increase of proinflammatory cytokines which participate in the development of most age-related diseases such as cancer, Alzheimer's disease, type 2 diabetes mellitus, stroke, cardiovascular diseases, and rheumatoid arthritis (RA). As cellular metabolism modulates T cell function, it can be assumed that metabolic changes accompany the differentiation of memory CD4+ T cells into senescent CD4+ T cell and contribute to memory CD4+ T cells dysfunction during aging.

Objectives: Therefore, we hypothesized that metabolic reprogramming in memory CD4+ T cells might represent an essential factor promoting immune cell dysfunction during aging, thereby fuelling to the pathogenesis of age-related diseases including RA

Methods: To this end, we analysed memory CD4+ T cells isolated from PBMCs of young donors (20-32 years) and old donors (52-67 years) by using MACS™ technology. *Ex vivo* memory CD4+ T cells were analysed by Seahorse™ Technology to determine proton efflux rate (PER) as a measure of glycolysis (glycoPER) and oxygen consumption rate (OCR) as a measure of mitochondrial respiration (mitoOCR). Cytokine expression and secretion was measured by flow cytometry and multiplex assay with and without Mitotempo an inhibitor of reactive oxygen species (ROS). Finally, TCR-stimulated memory CD4+ T cell proliferation was determined using CFSE and Ki-67 after 3 days and 4 days by flow cytometry. ROS and mitochondrial activity were analysed after 24 h using DCF-DA and CellROX Deep Red and Mitotracker by flow cytometry.

Results: In a quiescent state, memory CD4+ T cells from elderly individuals demonstrated a decrease in basal glycolysis and compensatory glycolysis, and an increase in the ratio of basal mitochondrial oxygen consumption rate (mitoOCR) to glycolytic proton efflux rate (glycoPER) while their mitochondrial profile was equivalent to that of young donors while the amount of mitochondria was higher with no increase in steady-state ATP level. In this line and in comparison to the younger reference group, memory CD4+ T cells from aged donors presented a greater spare respiratory capacity after TCR-activation and a marked increase in intracellular ROS production. Interestingly, we did not observe an impact of aging on memory CD4+ T cell proliferation as determined by CFSE and Ki-67. Although the capacity of intracellular cytokine expression did not differ between the compared groups, the levels of secreted IFN-γ, IP-10, IL-6, IL-9, and MCAF were significantly higher in the supernatants of memory CD4+ T cells taken from aged donors but were sensitive to ROS inhibition.

Conclusion: These findings suggest that metabolic reprogramming in human memory CD4+ T cells during aging results in an increased expression of proinflammatory cytokines as a result of ROS production and mitochondrial dysfunction. This process may culminate in T cell dysfunction and thus contribute to the pathogenesis of inflamm-aging and the development of age-related diseases such as rheumatoid arthritis (RA).

Disclosure of Interests: None declared.

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Hyperinflammation and Covid19

OP0313

PRELIMINARY CRITERIA FOR MACROPHAGE ACTIVATION SYNDROME ASSOCIATED WITH CORONAVIRUS DISEASE-19

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Background: COVID-19 runs a severe disease associated with acute respiratory distress syndrome in a subset of patients, and a hyperinflammatory response developing in the second week contributes to the worse outcome. Inflammatory