EULAR Projects in investigative rheumatology

**SP0095**  **EULAR POINTS TO CONSIDER ON BIG DATA**

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**Background:** There are tremendous opportunities for health research propelled by the recent expansion of big data and artificial intelligence. However, this is an emergent area where recommendations are needed.

**Objectives:** The objective was to develop points to consider for the use of big data by computational modelling, machine learning and artificial intelligence in rheumatic and musculoskeletal disorders (RMDs).

**Methods:** Based on a literature review of the current status of big data in RMDs and in other fields of medicine, on individual interviews of selected experts, and on the opinion of experts in a face-to-face meeting, points to consider were formulated, discussed and finalised by an international group of 14 experts from a range of disciplines including computer science and artificial intelligence. Levels of evidence and strengths of recommendations were allocated.

**Results:** The document comprises 5 overarching principles and 9 points to consider. The overarching principles address the definition of big data and artificial intelligence, types of big data, and ethical and general principles for dealing with big data in RMDs. The points to consider cover aspects of data sources and data collection, discussing privacy by design, use of specific data platforms, and data sharing; data analyses in particular through artificial intelligence and machine learning; they refer to big data as a moving field in need of correct reporting of methods used and of benchmarking; and data interpretation and implementation in clinical practice.

**Conclusion:** These EULAR points to consider provide a framework for the use of big data in RMDs.

**Disclosure of Interests:** None declared


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**SP0096** **MRI OF LARGE JOINTS IN ARTHRITIS: HOW TO DO AND HOW THEY ARE DIFFERENT FROM SMALL JOINTS?**

**Iris Eshed**, Sheba Medical Center, Tel Aviv University, Department of Diagnostic Imaging, Ramat Gan, Israel

The appendicular skeleton is frequently involved in patients with rheumatic diseases. Involved joints are affected by inflammation of the synovium and joint’s entheses. Imaging depicts joint derangement and generally mirrors the pathophysiology of the disease. MRI is considered the imaging modality of choice for the detection of acute joint inflammation as well as its structural sequelae.

Thus, MRI plays an important role in identifying, monitoring disease activity and therapeutic follow-up. The MRI features of inflammatory arthritis are well described, especially in the small appendicular joints of the hands and feet and include synovitis, erosions, osteitis, tenosynovitis and erosions.

In the current presentation, the typical MRI properties of large joints arthritis in different rheumatic entities will be presented with special focus on the difference from inflammatory findings in smaller appendicular joints.

**Disclosure of Interests:** None declared


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**SP0097**  **MRI OF ENTHEESIS: HOW TO DO AND WHAT TO LOOK FOR**

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Enthesitis, inflammation at the insertion site of tendon, ligament or joint capsule into bone, is considered a key pathological feature in spondyloarthritis (SpA) and psoriatic arthritis (PsA) [1]. Compared to conventional assessment of enthesitis using clinical scores, MRI detects both soft tissue and intra-osseous abnormalities in active enthesitis, potentially aiding early diagnosis and outcome measurement in SpA and PsA [2]. With the advent of treat-to-target concept and novel therapies, objective and sensitive monitoring of response of enthesitis to therapy is desirable, and a validated MRI scoring system would be a useful adjunct to clinical practice as well as providing additional information as an outcome measure in clinical trials.

The Outcome Measures in Rheumatology (OMERACT) MRI in Arthritis Working Group recently undertook a systematic literature review (SLR) aiming to critically evaluate the published literature for available methods of evaluating enthesitis using MRI in SpA and PsA patients, describing the MRI variables, definitions and scoring systems used to diagnose and monitor enthesitis [3]. Considerable limitations was found regarding standardisation of MRI enthesis definitions across studies and validity of available semi-quantitative scores as outcome measures. The findings suggested a need for reliable and validated MRI scoring system for enthesitis.

Subsequently, The OMERACT MRI group developed consensus definitions of key pathologies and three heel enthesitis multi-reader scoring exercises were done, separated by discussion, training and calibration [4]. In a final exercise, median pairwise single-measures intra-class correlation coefficients (ICCs; patient-level) for entheseal inflammation status/change scores were 0.83/0.82 for all readers. For radiologists and selected rheumatologists ICCs were 0.91/0.84 and quadratic-weighted kappas (lesion-level) 0.57-0.91/0.45-0.81. It was concluded that the proposed definitions and heel enthesis scoring system (OMERACT HEMRIS) are reliable among trained readers and promising for clinical trials [4].

This talk will briefly review the evidence behind the use of MRI for diagnosis and monitoring enthesitis, describe the recently developed OMERACT consensus definitions of key pathologies, and provide examples of these pathologies, aiming for the attendees to learn to be able to recognize them. Finally, an interactive quiz using cases for audience review will be undertaken to test this ability.

**REFERENCES:**


**Disclosure of Interests:** Mikkel Østergaard Grant/research support from: Abbvie, Celgene, Centocor, Merck, Novartis, Consultant for: Abbvie, BMS, Boehringer-Ingelheim, Celgene, El Lilly, Hospira, Janssen, Merck, Novartis, Orion, Pfizer, Regeneron, Roche, and UCB, Speakers bureau: Abbvie, BMS, Boehringer-Ingelheim, Celgene, El Lilly, Hospira, Janssen, Merck, Novartis, Orion, Pfizer, Regeneron, Roche, and UCB


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**SP0098**  **CRYSTAL ARTHROPATHIES: IS THERE A ROLE FOR MRI?**

**Kay-Geert Hermann**, Charité – Universitätsmedizin Berlin, Radiology, Germany

The plain radiographic features of gout are well known. However, the sensitivity of plain radiographs alone for the detection of signs of gout is poor in acute disease. Dual-energy computed tomography (DECT) and ultrasonography fill the gap for early and specific detection. However, there are instances in which MRI of the painful joints was already acquired. Therefore, it is crucial to know the imaging findings of gout in MRI. MRI per se is not suitable for imaging the calcified bone or soft tissue calcifications. However, there are special techniques such as gradient echo sequences or susceptibility-weighted imaging (SWI) to visualize calcifications. Furthermore, the inflamed joint with all its characteristics such as synovitis, tenosynovitis, and erosions is easily accessible by MRI. Specific findings in the
MRI DIFFICULT CASES OF THE AXIAL SKELETON

Lennart Jans, Ghent University Hospital, Radiology, Gent, Belgium

MRI has revolutionized the assessment of axial spondyloarthritides (SpA) in clinical practice. MRI of the sacroiliac joint is a cornerstone for diagnosis and classification. MRI of the spine may help with difficult cases as spinal changes may antedate sacroiliac changes and indicate disease burden. In daily practice, however, the interpretation of axial MRI is challenging. Experience has tempered the initial enthusiasm as the limitations of the ASAS criteria in daily practice become evident.

Firstly, the ASAS criteria are intended to classify patients with ‘back pain’ of more than 3 months’ duration and with onset before 45 years of age as having axial SpA. In other patient groups, however, sacroiliitis on MRI as defined by ASAS has a lower sensitivity and specificity.

Secondly, the definition of a ‘positive’ MRI for sacroiliitis is validated to limited extent only. MRI of the sacroiliac joint requires inflammatory changes to meet the criteria, without a clear quantitative requirement. Bone marrow oedema lacks sensitivity and specificity as MRI findings suggestive of sacroiliitis may be produced by non-inflammatory disorders, a point that remains poorly investigated.

Thirdly, structural changes in the sacroiliac joints are not taken into account in the ASAS criteria. The diagnostic performance of MRI of the sacroiliac joint could be improved by including structural lesions, but to date this is not the case.

Fourthly, spinal imaging is not included in the ASAS criteria. MRI of the spine is considered ‘positive’ when at least 3 inflammatory or several structural lesions are present, with a sensitivity and specificity similar to those of the sacroiliac joints. The difficulty here is the lack of data. It has not been reliably shown that inflammation proceeds syndesmophyte formation and MRI seems incapable of accurately evaluating treatment response. Only about 4% of patients with ‘negative’ sacroiliac MRI are reclassified based on positive spinal MRI findings.

Clinicians should be aware of unreasonable expectations on MRI. If MRI findings are considered in isolation the findings are not reliable. The diagnosis of SpA can only be made by an expert if patient’s history, clinical examination, laboratory findings, and imaging studies converge. When solving difficult cases, collaboration is key: clear communication between rheumatologist and radiologist is mandatory. Radiologists should withstand the pressure to call if a patient has SpA or not based on MRI alone.

REFERENCE:

Disclosure of Interests: None declared

Thursday, 13 June 2019
15:30:00 – 17:00:00
Ultrasound advanced I

US FOR ASSESSING LUNG INVOLVEMENT IN RHEUMATIC DISEASES – CLINICAL USE + DEMO

Andrea Delle Sedie, University of Pisa, Rheumatology Unit, Pisa, Italy

Background: Evaluation of interstitial lung disease (ILD) is always difficult (low sensitivity for X-ray and pulmonary function tests or high level of radiation for HRCT); ultrasound (US) has recently shown interesting results on truth, discrimination and feasibility. Due to the thickening of interlobular septa for edema or fibrosis, US beam can interact with those structure and produce artifacts on the screen: B-lines (BL) and pleural line irregularity (PLI). A positive correlation between BL and HRCT has been established both in systemic sclerosis patients and in other patients with ILD; more recently similar results have been published by using PLI as a finding for US assessment in patients.

BL has been recently defined by the OMERACT as a vertical hyperechoic reverberation artifact that arise from the pleural line, extend to the bottom of the screen without fading, and move synchronously with lung sliding, while PLI has been defined as a loss of regularity that may be associated with an increase in thickness, focal, diffuse, or nodular.

A low number of BLs has been described in healthy subjects but they are generally confined to the posterior and lower part of the thorax.

Up to now, many different scanning protocols have been used to assess BL or PLI in patients, providing similar results.

Conclusion: US lung evaluation is a useful and feasible imaging technique.

Disclosure of Interests: Andrea Delle Sedie Speakers bureau: Abbvie, UCB, Celgene, MSD

US FOR SYNOVIAL BIOPSIES – CLINICAL RELEVANCE AND SAFETY + DEMO

Andrew Filer, University of Birmingham, Institute of Inflammation and Ageing, Birmingham, United Kingdom

Background: The introduction of ultrasound guidance to access synovial tissue samples has facilitated a rapid growth in tissue-related research. Ultrasound guidance enables operators to use less invasive approaches compared to a gold standard direct vision arthroscopy procedure while maintaining the quality of samples obtained. Patients find the procedures easy to tolerate and are willing to undergo repeat biopsy, facilitating the analysis of tissue samples in clinical trials and experimental medicine studies. Advanced analytic techniques including single cell analytics are now being used to exploit the tissue samples obtained in order to provide dramatic leaps in understanding of synovial pathology.

Objectives: In this session the key aspects of the dominant techniques in use will be presented, including safety, patient tolerability and quality of output. The research and clinical utility of synovial biopsy will be discussed. Sonographic approaches to the major techniques will then be illustrated through video demonstrations, and competencies required to undertake training will be discussed alongside current EULAR initiatives for training. Finally, examples of research outputs generated through synovial biopsy will be explored alongside the logistics required to deliver such clinical studies.

Disclosure of Interests: None declared

Thursday, 13 June 2019
17:30:00 – 19:00:00
Fighting and fixing: from initiation to resolution of inflammation

T LYMPHOCYTES AND IMMUNE CELLS BALANCE MUSCLE REGENERATION AND AUTOIMMUNITY

Patricia Rovere-Querini, IRCCS Ospedale San Raffaele and Università Vita-Salute San Raffaele, Laboratory of Innate Immunity and Tissue Remodelling, Italy

Background: The skeletal muscle is the largest cellular compartment of the organism. It represents an immunologically unique or a "non classical" immunological privileged site, being normally protected from the noxious effects of inflammation. The molecular events that control the homeostatic response to acute muscle injury are however poorly understood. The available information indicates that it involves the cross-talk among various cell populations, which i) perceive the muscle damage and release alert signals, which attract and activate inflammatory cells and B cells, and ii) organize and initiate signaling and tissue repair.

The scenario is possibly even more complex during inflammatory idiopathic myositids (IIM) in which the immune privilege fails to protect the environment and...