Methods: Twelve TNFi naive AS patients (female 7/12; age 39±11years) with high disease activity (BASDAI 5.5±1.1) were included. [^{18}F]fluoride PET-CT scans were performed before initiation of TNFi therapy. In 2 patients, biopsies were obtained from PET identified spine lesions for histologic analysis. Of the remaining 10 patients, a second [^{18}F]fluoride PET-CT scan was performed after 12 weeks of TNFi treatment. PET scans were scored visually for positivity by two blinded expert readers. Subsequently, [^{18}F]fluoride uptake was quantified in PET positive (PET^{+}) lesions using the standardized uptake value corrected for individual integrated whole blood activity concentrations (SUV_{AUC}). Clinical response to TNFi was defined according to ASAS20 at 24 weeks.
Results: At baseline, in all patients at least one axial PET^{+} lesion was found. In spine, 6/10 patients showed 84 lesions (range 2–30;63% thoracic spine, primarily costovertebral joints) and in the SI joints in 9/10 patients were PET^{+} (Fig A). Histological analysis of PET^{+} lesions in the spine confirmed local osteoid formation, which was nearly absent in PET negative lesions. Quantitative PET analysis revealed significantly lower [^{18}F]fluoride uptake in spine lesions at baseline in responders than in non-responders. This difference remained after 12 weeks of treatment (mean difference in SUV_{AUC}: -0.5, 95% CI:[-0.7,-0.2], p=0.001). After 12 weeks of TNFi treatment, [^{18}F]fluoride uptake in clinical responders decreased significantly in the costovertebral (mean difference SUV_{AUC}: -1.0, 95% CI: [-1.3,-0.7]) and SI joints (mean difference in SUV_{AUC}: -1.2, 95% CI: [-2.3,-0.2]) (fig B) in contrast to non-responders (mean difference in SUV_{AUC}: -0.4, 95% CI: [-2.3,1.6] and +0.4, 95% CI: [-0.6, 1.4], respectively). [^{18}F]fluoride uptake in other spinal lesions such as bridging syndesmophytes showed heterogeneous response without a significant decrease in [^{18}F]fluoride accumulation over time at a group level.

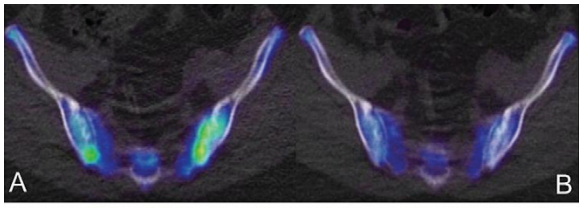

Figure: Example of [^{18}F]fluoride uptake in both SI joints at baseline (A) and a clear decrease of uptake after 12 weeks of TNF-I (B).

Conclusions: [^{18}F]fluoride PET-CT enables non-invasive visualization of (changes in) lesions with bone formation of the whole spine and SI joints in clinically active AS patients, which is confirmed by histological signs of osteoid formation. Part of these lesions, in particular costovertebral lesions in spine and SI joints, decreased in clinical responders to TNFi (and not in non-responders), whereas other spinal lesions remained unchanged at a group level.
Disclosure of Interest: None declared
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FRI0624 STRUCTURAL MRI-BASED CONNECTOMICS IN SLE: A PILOT STUDY

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Background: Neuropsychiatric manifestations are common in patients with systemic lupus erythematosus (SLE). Furthermore, subclinical brain damage occurs in an even higher fraction of patients. However, little is known about the effect of these phenomena on brain connectivity. MRI-based connectomics relies on graph analysis of structural and functional images to detect alterations of the topographic organization of the brain and has been successfully employed to dissect network disassembly in neuroinflammatory diseases such as multiple sclerosis (MS) and Devic's syndrome.
Objectives: To investigate the topographic organization of the brain of patients with SLE with and without neuropsychiatric manifestations.
Methods: Thirty-two patients with SLE (12 with overt neuropsychiatric involvement as per ACR criteria) were enrolled and compared with 32 healthy controls (HC) and 32 patients with relapsing-remitting MS, all matched for sex, age and disease duration (where applicable). Diffusion tensor (DT) and dual-echo MRI scans were obtained. Structural connectivity matrices between 116 cortical and subcortical brain regions were estimated and global and nodal network metrics were calculated.
Results: Conventional MRI revealed that patients with SLE had significantly higher T2-lesional volumes when compared to controls ($p<0.0001$). Patients with definite NPSLE had a higher lesion burden (p=0.006). Network strength, transitivity and global efficiency were all significantly impaired in patients with MS and SLE when compared to HC ($p<0.0001$). MS and SLE were also characterized by higher average path length when compared to HC ($p<0.0001$). Global structural alterations were more significant in MS patients than in patients with SLE (p from 0.005 to 0.01 at multiple comparison). However, antiDNA-positive patients (n=24) showed a more severe phenotype when compared to antiDNA-negative patients (p from 0.026 to 0.041) and did not differ significantly from patients with MS. When regional hubs were analysed, patients with SLE and MS showed a reduced strength compared to HC (p from <0.0001 to 0.001 at multiple comparison). Hub strength impairment was more pronounced in MS when compared to SLE and preferentially involved hubs located in fronto-temporo-parieto-occipital cortices, subcortical nuclei (including the thalamus, caudate nucleus and putamen) and cerebellum (p from 0.001 to 0.05 at multiple comparison). No significant associations were found between global structural parameters, clinical diagnosis of neuropsychiatric SLE, other SLE sub-phenotypes, presence of antiphospholipid antibodies, antiphospholipid syndrome and SLE-related damage burden.
Conclusions: Structural alterations of global and regional brain connectivity occur in patients with SLE, irrespectively of the clinical phenotype. AntiDNA-positive patients are characterized by a more severe phenotype, which is similar to that of patients with relapsing-remitting MS.
References:
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Disclosure of Interest: None declared
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FRI0625 IMPROVEMENT OF JOINT INFLAMMATION AS ASSESSED BY MRI AND POWER DOPPLER ULTRASOUND (PDUS) IN AN OPEN LABEL STUDY IN PATIENTS WITH ACTIVE PSORIATIC ARTHRITIS TREATED WITH SECUKINUMAB (PSARTROS)

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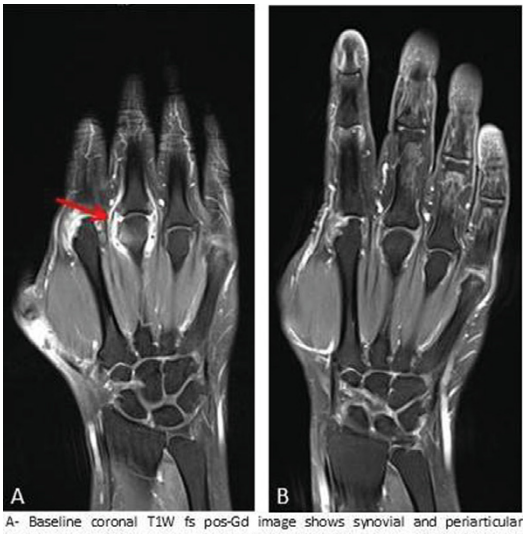
Background: Secukinumab, an anti-interleukin 17A monoclonal antibody, showed significant improvement of signs and symptoms of psoriatic arthritis (PsA) in FUTURE 1 study. Available studies used conventional radiography, not allowing a deeper imaging analysis of the inflammatory changes during application.
Objectives: To assess short term efficacy of secukinumab on inflammation and structural damage according to change in OMERACT-EULAR ultrasound score and the MRI PsAMRIS score in PsA patients.
Methods: PsA patients with active disease (TJC and SJC $\geq$3), were included in the 24 week open label prospective PSARTROS study and treated with subcutaneous secukinumab 300 mg once weekly over 4 weeks, then once every 4 weeks. Baseline 1,5T MRI hand scans and ultrasound imaging of 28 joints were performed at baseline and after 24 weeks of treatment. MRI was scored according to PsAMRIS, ultrasound for synovial hypertrophy and Doppler activity according to OMERACT scores. Statistical significance was set at $p\leq0.05$.
Results: 20 patients, mean age 52±9.9 years, 60% female, mean disease duration 6.7±5.9 years, 50% naïve for biological therapy, were included in the study. Three patients were early discontinued (recurrent pharyngitis, lack of efficacy, withdrawal of consent), and were not included into the longitudinal analysis. Baseline DAS28 was 5.03±0.96, baseline DAPSA was 32.2±12. 1. On baseline MRI, all patients had at least one inflammatory sign (synovitis: 90%, osteitis: 20%, periarticular inflammation: 25%, flexor tenosynovitis: 35%, bone proliferation: 30%, erosions: 60%). Baseline composite PsAMRIS score



A- Baseline coronal T1W fs pos-Gd image shows synovial and periarticular thickness and enhancement (arrow), indicating active synovitis and periarticular inflammation.
B- Follow up image after 24 weeks treatment shows resolution of the periarticular inflammation and only residual synovial enhancement.