Figure. ESSDAI Change from Baseline over Time up to Week 24 Reveals a Statistically Significant Dose Response Relationship

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Meniscus : an innocent bystander in osteoarthritis?.

OP0303

CORTICOSTEROID INJECTION IN KNEE OSTEOARTHRITIS IS ASSOCIATED WITH REDUCTION IN MENISCAL THICKNESS AND JOINT SPACE WIDTH WITH NO EFFECT ON CARTILAGE THICKNESS: A CASE CONTROL STUDY

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Background: Intra-articular corticosteroid injections (IACI) are commonly used for the treatment of symptomatic knee osteoarthritis (OA) and therapeutic guidelines have recommended their use. However, their safety regarding the evolution of structural changes remains unknown.

Objectives: This study explored the effects of IACI on the evolution of knee OA structural changes assessed by magnetic resonance imaging (MRI).

Methods: Participants were selected from the Osteoarthritis Initiative database. In this nested case-control design study, participants who received one treatment with IACI and had MRI exams available at the yearly follow-up visits before (pre-treatment), during (treatment), and after (post-treatment) were defined as "cases". Each case was matched with one control for age, gender, body mass index (BMI), height, joint space width (JSW), cartilage volume, bone marrow lesion (BML), meniscal extrusion, and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain at baseline. Ninety-three (93) participants fulfilling the inclusion criteria were selected and matched to controls ($n=93$). The study structural variables were MRI (cartilage volume, meniscal thickness, bone marrow lesion (BML), bone curvature), X-rays (JSW), and symptoms (WOMAC pain), assessed at the yearly consecutive visits and changes measured within the follow-up periods.

Results: At baseline, the control and treatment groups were balanced. In the pre-treatment period, the cartilage volume loss in the medial compartment was significantly greater in the IACI ($p=0.006$) compared to the control group, with a numerical trend ($p=0.071$) in the lateral compartment. In the treatment period, the cartilage loss was not different between groups, with the exception

of a significantly greater loss in the lateral compartment in the IACI group ($p=0.041$). In the post-treatment period there was no difference in the cartilage loss between the groups in both compartments. For the meniscal thickness loss in the pre-treatment period, no difference was found between groups; however, there was a significantly greater loss ($p=0.007$) during the treatment period in the IACI. In the post-treatment period, the loss of the medial meniscus was similar in both groups. For the lateral meniscus, there was no significant difference at any time between the two groups. The loss in JSW in the pre- and post-treatment periods was not different between groups, but was significantly greater ($p=0.011$) in the IACI group in the treatment period. The changes in the BML sizes over time were small and similar between groups. For the bone curvature, IACI group showed a smaller change compared to the control ($p=0.037$) at the treatment period. The WOMAC pain changes in both groups were small and unlikely to be clinically relevant.

Conclusion: This study provides evidence that in knee OA, IACI were not associated with the occurrence of any deleterious effect on knee structures post-treatment, including cartilage volume and loss. The increase in the rate loss of medial meniscal thickness, which was associated with a loss of JSW, was a transient phenomenon and its clinical relevance unknown at that time.

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SpA: Innovative techniques in spondyloarthritis research – Is there light at the end of the tunnel for our patients?

OP0304

METABOLOMICS PROFILING OF HUMAN SERUM FOR DISCOVERING BIOMARKERS TO DIAGNOSE PSORIATIC ARTHRITIS AND ANKYLOSING SPONDYLITIS WITH HIGH SPECIFICITY

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Background: High-specificity biomarkers that can differentiate PsA and AS patients from healthy people, as well as RA patients, would be extremely helpful for early diagnosis and treatment of these two diseases. Based on the hypothesis that each disease state may cause specific changes to the metabolome, metabolomics is becoming a powerful tool for biomarker discovery. In this work, we applied a high-performance chemical isotope labeling (CIL) LC-MS platform to search for biomarker candidates of PsA and AS in human serum samples.

Objectives: We aimed to identify metabolite biomarkers with high specificity for PsA and AS.

Methods: Serum samples were collected from 331 subjects, including 100 healthy controls, 48 PsA patients, 52 AS patients and 131 RA patients. The average age of each group was: 52.6 (control), 50.7 (PsA), 51.8 (AS) and 53.1 (RA) years. After pre-treatment, each sample was incubated with ¹²C-dansyl chloride, which can label the amine/phenol-containing metabolites. The reference sample for relative quantification was prepared by mixing all individual samples and then labeled by ¹³C-dansyl chloride. With this normalization, the individual samples and the reference sample were mixed at an equal amount. Finally, we used an LC-QTOF-MS platform to analyze the mixtures and measure the ¹²C/¹³C peak pairs.

Results: We detected 1,149 peak pairs commonly existing in the serum samples. Using our dansyl-library of 700 dansyl-labeled standards and a prediction library, which contains the predicted retention times and mass values of 3,431 dansylated human metabolites, we identified 134 and 141 peak pairs, respectively. The relative concentrations are calculated from the intensity ratios of ¹²C/¹³C peak pairs. We first visualized the entire amine/phenol-submetabolome for all phenotypes using the partial least squares discriminant analysis (PLS-DA). We found that the most significant between-group separation was between healthy controls and all the patients. No significant sex or age effect was observed. Furthermore, among the three diseases, PsA and AS samples were closely clustering, while the RA group was well separated from them. Therefore, we chose a two-step diagnosis approach that first differentiates PsA patients from controls/RA patients and then filters out the AS patients wrongly classified as PsA in the first step. The same strategy was conducted for AS. Stipulating a fold change larger than 1.5 with the false discovery rate lower than 5%, we found 74 metabolites having significantly