ILD. The 80% cut-off for %DLco may be proposed to identify isolated vascular involvement, while %FVC at 80% or %DLco at 70% to identify significant parenchymal involvement. These results need to be confirmed in larger multi-centric cohorts.

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OP0182

PROTEOGLYCAN LOSS IN ARTICULAR CARTILAGE IS ASSOCIATED WITH JOINT INFLAMMATION SEVERITY IN PSORIATIC ARTHRITIS – A COMPOSITIONAL MAGNETIC RESONANCE IMAGING STUDY

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Background: Even though cartilage loss is a known feature of psoriatic arthritis (PsA), little is known about its role in the pathogenesis of PsA. Using delayed gadolinium-enhanced magnetic resonance imaging of cartilage (dGEMRIC) as a non-invasive marker of the tissue's proteoglycan content, such early (i.e. pre-morphological) changes have been associated with inflammation in rheumatoid arthritis (RA). Yet, this association has not been studied before in PsA.

Objectives: Is the severity of local joint inflammation associated to local proteoglycan loss in PsA patients?

Methods: Metacarpophalangeal (MCP), proximal interphalangeal (PIP), and distal interphalangeal (DIP) joints of 17 patients with active PsA were evaluated by high-resolution clinical standard morphological and dGEMRIC sequences using a 3T MRI scanner (Magnetom Skyra, Siemens) and a dedicated 16-channel hand coil. Images were analyzed by two independent raters for dGEMRIC indices, PsA MRI scores (PsAMRIS) and total cartilage thickness (TCT). Kendall-Tau correlation coefficients (τ) were calculated.

Results: We found significant negative correlations between dGEMRIC indices and total PsAMRIS ($\tau = -0.5$, $p = 0.012$), synovitis ($\tau = -0.56$, $p = 0.006$), flexor tenosynovitis ($\tau = -0.4$, $p = 0.049$), and periarticular inflammation ($\tau = -0.72$, $p < 0.001$). Significant positive correlations were found between TCT and dGEMRIC indices in all joint levels ($\tau = 0.43$, $p < 0.001$). No significant correlations were determined between dGEMRIC indices and bone erosion, bone edema or bone proliferation.

Conclusion: In PsA, proteoglycan loss as assessed by dGEMRIC is associated with periarticular inflammation, synovitis, and flexor tenosynovitis, but not with bone erosion or proliferation, thereby highlighting the need for effective anti-inflammatory treatment regimes. Beyond morphology, advanced MRI techniques may be used to assess cartilage composition in PsA and to identify early

Figure 1 Right hand of a 26-year-old male with psoriatic arthritis Coronal STIR image (A) of digits 1-5, transversal fat-saturated (fs) T2-weighted image of digits 2-4 (B) and the corresponding transversal fs contrast-enhanced T1-weighted image (C) at the distal portion of the proximal phalanges. Horizontal white bar in (A) indicates level of transversal slices (B) & (C). Sagittal fs Proton Density-weighted image of the third digit (D). A: Increased signal at the collateral ligaments and synovitis of the proximal interphalangeal (PIP) joint of the third digit (white arrow). Periarticular inflammation around the PIP joint and the body of the proximal phalanx of the third digit (arrowhead). B & C: Extensive flexor tenosynovitis (asterix) and periarticular inflammation in the subcutaneous tissues (arrowhead) alongside thickened flexor tendon pulleys (arrow). D & E: Representative sagittal T1-weighted images of the MCP, PIP and DIP joint of the 3rd digit. Following iv contrast administration and appropriate delay of 40 min, A gives the morphological T1 map, while B gives the corresponding parameter map with dGEMRIC values [ms] overlaid. Note the significant decrease in dGEMRIC indices of the PIP joint as compared to the MCP joint.

changes in cartilage as an imaging biomarker with potential application in detection and monitoring of PsA.

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OP0183

DO CARTILAGE LAMINAR COMPOSITIONAL CHANGES AS ASSESSED BY T2 RELAXOMETRY PREDICT INCIDENT AND WORSENING OF STRUCTURAL MORPHOLOGIC DAMAGE IN THE SAME PLATE 3 YEARS LATER?

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Background: To address the question whether laminar changes in knee cartilage T2 are relevant for prediction of lesion onset or progression in the same articular plate we included two different samples from the Osteoarthritis Initiative (OAI) study without radiographic osteoarthritis (ROA), i.e. so-called "healthy controls" with no ROA in either knee and being free of risk factors, and those with K-L 0 in one knee and ROA in the contralateral knee. Given the concept of the osteochondral unit, we hypothesize that superficial T2 is elevated in cartilage plates with subsequent surface damage development or worsening and deep layer T2 is elevated for those with subsequent bone marrow lesion (BML) development or worsening.

Objectives: To analyze whether knees with subsequent morphologic cartilage and BML development or worsening exhibit elevated cartilage T2 compared to those that do not develop such structural damage in the same plate 3 years later.

Methods: We included 63 knees from the OAI without ROA (K-L 0), but with definite ROA (K-L ≥ 2) in the contralateral knee, and 78 participants from the OAI healthy reference cohort.

Cartilage integrity or damage and subchondral bone marrow lesions (BMLs) were assessed for year 1 (i.e. baseline (BL) in this analysis) and year 4 (Y4) in chronological order using the semi-quantitative MOAKS scoring system.

BL deep and superficial layer cartilage T2 was computed from sagittal multi-echo spin echo MR images. Because cartilage T2 is known to display spatial variation with tissue depth, the segmented cartilages were computationally divided into superficial and deep 50%, based on the distance between the segmented cartilage surface and bone interface. Statistical analyses were performed for the femoro-tibial (FT) joint on a plate level, i.e. medial femur (MF), medial tibia (MT), lateral femur (LF) and lateral tibia (LT), using UNIANOVA with adjustment for age, body mass index, sex, and sample.

Results: 141 participants were included. Of these 79 (56%) were women, had a mean age of 59.4 ± 9.1 years and a mean body mass index of 25.8 ± 4.1 m/kg².

52 (37%) had prevalent cartilage lesions in the medial FT joint and 67 (48%) in the lateral FT joint. For BMLs these numbers were 15 (11%) medially and 14 (10%) laterally. Worsening of FT cartilage lesions from BL to Y4 were seen in 10 (7%) medially and 21 (15%) in the lateral FT compartment. Incident FT cartilage lesions were seen in 11 (11.5%) medially and 8 knees laterally. No worsening BMLs were seen

medially and 2 knees showed worsening BMLs laterally. 10 (7%) knees showed incident BMLs medially and 8 (6%) knees in the lateral FT compartment. Deep layer T2 showed prolongation in the LT in knees with incident LT cartilage lesions (n=8, 34.5 vs. 32.7 ms, p=0.02) and for MF in knees with MF cartilage lesion worsening (n=9, 47.6 vs. 41.4 ms, p=0.01) and MF BML incidence (n=6, 45.4 vs. 41.6 ms, p=0.000). Superficial T2 showed prolongation in the MT only in those knees with MT cartilage lesion worsening (n=2, 47.3 vs. 43.4 ms, p=0.03). No additional associations were seen for the superficial layer.

Conclusion: For knees without ROA, BL deep layer T2 prolongation was seen for those who developed incident cartilage damage in the LT, and those with worsening cartilage damage and incident BMLs in the MF, respectively. Superficial T2 showed prolongation only in the MT for those with MT cartilage lesion worsening. In summary and contrary to our hypothesis the deep cartilage layer seems to be more relevant for cartilage damage development or worsening in the same FT plate than the superficial layer.

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OP0184

RISK OF COMORBIDITIES FOLLOWING INCIDENT CLINICIAN-DIAGNOSED KNEE OR HIP OSTEOARTHRITIS: A REGISTRY-BASED COHORT STUDY

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Background: Osteoarthritis (OA) is associated with increased comorbidity, but knowledge of the temporal relationships between OA and comorbidities is limited.

Objectives: To estimate the risk of consulting for comorbidities in people with incident clinician-diagnosed knee or hip OA.

Methods: Using the Swedish Population Register, we identified all residents aged 35 years or above in the Skåne region, Sweden (total pop. 1.23 million) in the year 2009. We used the Skåne Health Care Register (SHR), a comprehensive register based on physicians' International Classification of Disease (ICD) 10, to identify persons who had at least one diagnosis of knee or hip OA – the exposures of interest – and 18 other diagnoses (Figure 1) – the outcomes of interest – between 1 January 2010 and 31 December 2017. To minimize potential confounding due to propensity to seek care, persons had to have at least one health-care visit with any diagnosis registered between 1 January 1998 and 31 December 2009 to be included. We excluded persons with a knee or hip OA diagnosis before 1 January 2010, and for each analysis, persons with a previous diagnosis of the outcome diagnosis of interest. People were followed from 1 January 2010 until relocation outside of the region, death, outcome diagnosis, or 31 December 2017, whichever came first. We calculated hazard ratios (HR) of each outcome diagnosis using Cox proportional hazard models with incident knee and hip OA as time-varying exposure. Time from start of follow-up to the date of an OA diagnosis was treated as unexposed, while time from an OA diagnosis to the outcome diagnosis was treated as exposed. Models were adjusted for residential area, if born in Sweden, annual income, years of education, marital status, sex, and age (all retrieved from Statistics Sweden), and baseline conditions (i.e. the other outcome diseases of interest, and alcohol-related disorders) as registered in SHR before 1 January 2010.

Results: We included 548,681 persons in the Skåne population having at least one health-care visit during 1998 to 2009 and no doctor-diagnosed knee or hip OA. Of these, 36,465 persons consulted for knee OA and 14,477 for hip OA during the follow-up period (Table 1). Persons with clinician-diagnosed incident knee or hip OA have 8-61% higher hazard of depression, cardiovascular diseases, back pain, and osteoporosis than persons without an OA diagnosis (Fig. 1). Both knee and hip OA persons have increased risk of diabetes, however the 95% confidence interval excluded 1 only for knee OA (Fig. 1). Also, only knee OA patients have an increased risk of fracture to the forearm. For the rest of the diagnoses, we found either no increased risk for knee or hip OA persons, or estimates with

wide confidence intervals, excluding any clear interpretations of the direction or size of the effects.

Table 1. Demographics of the study cohort at start of follow-up (Jan. 1, 2010).

	No OA (n=497,739)	Incident knee OA (n=36,465)	Incident hip OA (n=14,477)
Age, yrs (SD)	57.3 (14.6)	62.2 (12.2)	65.3 (11.7)
Women, n (%)	254,593 (51)	21,553 (59)	8,306 (57)
Married ^a , n (%)	350,172 (70)	27,955 (77)	10,937 (76)
Born in Sweden ^b , n (%)	422,713 (85)	31,292 (86)	12,949 (89)
Education ^c , n (%)			
<10 yrs	128,738 (26)	11,364 (31)	4,745 (33)
10-12 yrs	222,147 (45)	16,390 (45)	6,050 (42)
13-14 yrs	59,950 (12)	3,908 (11)	1,556 (11)
≥15 yrs	83,620 (17)	4,590 (13)	2,065 (14)
Income in 100,000 SEK ^d , mean (SD)	2.3 (3.0)	2.1 (2.4)	2.1 (2.6)

Missings: ^a29 ^b44, ^c3,558, ^d2

Conclusion: Incident clinician-diagnosed knee and hip OA are associated with increased risk of consultation for depression, cardiovascular disease, back pain, osteoporosis, and diabetes. Results support previous findings for cardiovascular diseases and diabetes, however suggesting that the risk of diabetes is mainly associated with knee OA.

Figure 1. Adjusted hazard ratios of consultation for diseases occurring in persons with incident doctor-diagnosed knee or hip OA compared to non-OA persons. *Only women included in analysis. **Only men included in analysis.

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OP0185

KNEE JOINT DISTRACTION IS MORE EFFICIENT IN RESTORING CARTILAGE THICKNESS THAN HIGH TIBIAL OSTEOTOMY IN PATIENTS WITH SEVERE KNEE OSTEOARTHRITIS

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Background: Both high tibial osteotomy (HTO) and knee joint distraction (KJD) are joint preserving surgical techniques unloading the affected femorotibial