macrophages, Lysm^{cre} x Csfr1-Stop-DTR were injected intrathecal or systemically with diphtheria toxin (DT).

Results: Intraarticular monoiodoacetate injection induced OA and signs of persistent pain, such as mechanical hyperalgesia and deficits in weight bearing. The persisting pain-like behaviors were associated with accumulation of F4/80⁺ macrophages with an M1-like phenotype in the lumbar DRG appearing from 1 week after MIA injection, and that persisted till at least 4 weeks after MIA injection. Macrophages infiltrated DRG were also observed in the rat groove model of OA, 12 weeks after application of a groove at the femoral condyles. Systemic or local depletion of DRG macrophages during established MIA-induced OA completely ablated signs of pain, without affecting MIA-induced knee pathology. Intriguingly when monocytes/macrophages were depleted prior to induction of osteoarthritis, pain-like behaviors still developed, however these pain-like behaviors did not persist over time. *In vitro*, sensory neurons innervating the affected OA joint programmed macrophages into a M1 phenotype. Local repolarization of M1-like DRG macrophages towards M2 by intrathecal injection of M2 macrophages or anti-inflammatory cytokines resolved persistent OA-induced pain.

Conclusion: Overall we show that macrophages infiltrate the DRG after knee damage and acquire a M1-like phenotype and maintain pain independent of the lesions in the knee joint. DRG-infiltrating macrophages are not required for induction of OA pain. Reprogramming M1-like DRG-infiltrating macrophages may represent a potential strategy to treat OA pain.

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OP0084 PRESSURE PAIN THRESHOLDS AND THE ASSOCIATIONS WITH CHRONIC WIDESPREAD PAIN, KNEE OSTEOARTHRITIS AND OBESITY IN INDIVIDUALS WITH KNEE PAIN

C. Sylwander^{1,2}, E. Haglund^{1,3,4}, I. Larsson^{1,2,4}, S. Bergman^{1,4,5}, M. Andersson^{1,4}. ¹Spenshult Research and Development Centre, Halmstad, Sweden; ²Halmstad University, School of Health and Welfare, Halmstad, Sweden; ³Halmstad University, School of Business, Engineering and Science, Halmstad, Sweden; ⁴Lund University, Department of Clinical Sciences, Section of Rheumatology, Lund, Sweden; ⁵The Sahlgrenska Academy, University of Gothenburg, Primary Health Care Unit, Department of Public Health and Community Medicine, Institute of Medicine, Gothenburg, Sweden

Background: Approximately 30% of individuals with symptomatic knee osteoarthritis (OA) had developed chronic widespread pain (CWP) over a period of 20 years [1]. In order to prevent CWP in those with knee pain, it is important to study associated factors.

Figure 1 Differences in mean PPT in the eight tender points

Objectives: The aim was to study pressure pain thresholds among individuals with knee pain with or without radiographic changes, and associations with CWP, radiographic knee OA, and obesity.

Methods: Out of 300 individuals with knee pain (with or without radiographic changes) from an ongoing longitudinal study, 279 conducted pressure pain thresholds (PPT) measurement at baseline in this cross-sectional study (71% women; mean age 51 years). The PPT were measured using a computerized pressure algometry on eight predefined tender points (Figure 1) out of the 18 points as part of the definition of fibromyalgia [2]. PPTs were dichotomised based on the lowest tertile vs the two higher tertiles for each of the eight points. A group that had ≥ 4 points with low PPT (low PPT group) was compared to a group that had < 4 low PPT (not low PPT group). A pain mannequin categorised the participants in three different pain groups: CWP, chronic regional pain (CRP), and no chronic pain (NCP) according to the definition of the ACR [2]. Radiographic knee OA was defined according to the Ahlbäck five grading scale as having score ≥ 1 vs score 0 [3]. Obesity was measured by bioimpedance measuring BMI and visceral fat area (VFA, cm²). To study associations, a crude logistic regression model controlled for age and sex was used including main and significant variables

Results: The prevalence of CWP was 37% and higher in the low PPT group compared to those in the not low PPT group (Table 1). No differences were found between the groups in BMI, VFA or radiographic knee OA (Table 1). The low PPT group had significantly lower mean PPT on all eight tender points, was younger, had more pain sites, and more cases of fibromyalgia compared to the group with not low PPT (Table 1, Figure 1). Age (OR 0.95; 95% CI 0.92–0.97), having CWP (OR 3.00; CI 1.66–5.06), fibromyalgia (OR 21.91; CI 2.45–194.69) and increased number of pain sites (OR 1.13; CI 1.05–1.22) were associated with low PPT.

Table 1. Descriptive statistics for the whole sample and for the groups: low PPT and not low PPT

	All n = 279	Low PPT n = 99	Not low PPT n = 180	p-value
Age, mean years (sd)	51 (9)	49 (9)	53 (8)	<0.001
Women, n (%)	197 (71%)	69 (70%)	128 (71%)	0.804
Pain group, n (%)				<0.001
NCP/CRP	160 (63%)	41 (47%)	119 (71%)	
CWP	95 (37%)	46 (53%)	49 (29%)	
Numbers of pain sites, mean (sd)	5 (4)	6 (5)	4 (3)	0.003
Fibromyalgia, n (%)	8 (3%)	7 (9%)	1 (1%)	0.001
Knee OA Ahlbäck, n (%)	59 (23%)	16 (18%)	43 (26%)	0.132
BMI, n (%)	127 (48%)	42 (47%)	85 (48%)	0.801
Normal	139 (52%)	48 (53%)	91 (52%)	
Overweight/Obese	114 (54)	115 (51)	113 (55)	0.788

Conclusion: Baseline characteristics of individuals with knee pain showed a higher prevalence of CWP than in the general population [4]. In the group with low PPT, the prevalence was even higher. The study found associations between CWP and low PPT, however, almost half of the individuals with low PPT reported NCP/CRP. Moreover, a third in the group that not had low PPT reported CWP. The development of widespread pain in individuals with knee pain needs to be further studied over time to increase the knowledge of CWP's origin in order to prevent the condition.

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OP0085 THE CHANGING STATES OF FIBROMYALGIA IN A LONGITUDINAL COHORT OF PATIENTS WITH AXIAL SPONDYLOARTHRITIS

S. Aarrestad Provan^{1,2}, L. Dean¹, G. T. Jones¹, G. Macfarlane¹. ¹University of Aberdeen School of Medicine, Medical Sciences and Nutrition, Epidemiology Group, Aberdeen, United Kingdom; ²University of Aberdeen School of Medicine, Medical Sciences and Nutrition, Aberdeen, United Kingdom

Background: The identification of predictors for longitudinal fibromyalgia (FM) development has been identified as a research priority in a recent systematic review and meta-analyses (1). This paper examines the

Table 1.

Variable	Models of FM development		Models of FM recovery	
	Adjusted univariate OR (95% CI)	Multivariate model OR (95% CI)	Adjusted univariate OR (95% CI)	Multivariate model OR (95% CI)
Age years	1.01 (0.98-1.03)	1.00 (0.98-1.03)	1.00 (0.97-1.02)	1.02 (0.99-1.06)
Female gender	1.89 (1.01-3.53)*	2.04 (0.99-4.21) [§]	0.90 (0.40-2.04)	1.20 (0.48-3.03)
BASDAI per unit	1.39 (1.21-1.60)**	1.27 (1.08-1.49) *	0.79 (0.63-1.00)*	
BASFI per unit	1.22 (1.08-1.38)*		0.70 (0.56-0.88)*	0.68 (0.53-0.86)*
ASDAS-CRP per unit	1.47 (1.11-1.95)*		0.63 (0.39-1.01) [§]	
Started on TNF	1.95 (0.92-4.15) [§]		2.78 (1.21-6.38)*	4.23 (1.63-11.00)*
Symptomscale per unit	1.28 (1.13-1.45)**		0.76 (0.61-0.96)*	
WPI index per unit	1.24 (1.13-1.36)**	1.14 (1.02-1.28) *	0.84 (0.73-0.96)*	0.84 (0.72-0.97)*
HADS Anxiety per unit	1.12 (1.05-1.20)*		0.96 (0.88-1.04)	
Chalder per unit	1.14 (1.05-1.24)*		0.91 (0.81-1.02)	
Jenkins baseline	1.07 (1.01-1.13)*		0.90 (0.83-0.98)*	
ROC/sensitivity/specificity		0.75/55.6/75.6		0.78/62.3/73.7

Logistic regression models. OR, Odds ratio, BASDAI; Bath Ankylosing Spondylitis Disease Activity Index; BASFI; Bath Ankylosing Spondylitis Functional Index, TNF; Tumour Necrosis Factor inhibitor, HADS; Hospital Anxiety Scale, WPI; widespread pain index, Chalder; Chalder fatigue index, Jenkins; Jenkins sleep evaluation, ROC; receiver operator curve.

longitudinal development of, or recovery from, FM in patients with axial Spondyloarthritis(axSpA).

Objectives: To identify predictors for FM development and recovery in patients with axSpA.

Methods: The British Society of Rheumatology Biologics Register (BSRBR-AS) recruited patients with axSpA from 83 centres in a prospective study. Fibromyalgia was diagnosed using the self-reported Fibromyalgia Survey Diagnostic Criteria (FSDC). Measures of axSpA disease activity and clinical findings were recorded at regular intervals. We identified predictors for developing FM, and for recovering from FM, between yearly visits using uni- and multivariate logistical regression models.

Results: Eight hundred and one patients had two or more visits and were eligible for inclusion. 686 patients did not have FM at baseline, of whom 45 had developed FM by follow-up. 115 patients had FM at baseline, of whom 77 had recovered by follow-up. The uni- and multivariate models are presented in table 1.

Conclusion: The development of FM in patients with axSpA can be predicted by high levels of axSpA activity and presence of widespread pain, while low levels of the same variables, and starting a TNF-inhibitor predict recovery from FM. The presence of co-morbid FM should be considered in patients with a history of high axSpA disease activity and wide spread pain.

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OP0086

THE DEGREE OF BONE MARROW EDEMA AS DETECTED BY MAGNETIC RESONANCE IMAGING IN THE SACROILIAC JOINTS AND THE SPINE SUSPICIOUS OF AXIAL SPONDYLOARTHRITIS IN THE GENERAL POPULATION IS ASSOCIATED WITH DIFFERENT FACTORS

X. Baraliakos¹, A. Richter², D. Feldmann¹, A. Ott¹, R. Buelow³, C. Schmidt², J. Braun¹ on behalf of n/a. ¹Rheumazentrum Ruhrgebiet Herne, Ruhr-University Bochum, Herne, Germany; ²Institute for Community Medicine, University Greifswald, Greifswald, Germany; ³Department of Diagnostic Radiology and Neuroradiology, University Medicine Greifswald, Greifswald, Germany

Background: Taking advantage of a large population-based study we have recently reported that the frequency of bone marrow edema (BME) and fatty lesions (FL) in the sacroiliac joints (SIJ) and the spine of individuals <45 years detected by magnetic resonance imaging (MRI) suggestive of axial spondyloarthritis (axSpA) is higher than expected.

Objectives: To identify and compare factors associated with the extension of MRI lesions in the spine and the SIJ in the general population.

Methods: All available spinal- (sagittal T1/T2 sequences) and SIJ- (semicoronal STIR sequences) MRIs were evaluated by two trained readers blinded to clinical data. BME (SIJ and spine) suggestive of axSpA were recorded. The

extension of BME was quantified using the Berlin MRI score. Discrepancies were resolved by consensus. Degenerative lesions of the Modic type were excluded. The association of age (increase per decade), sex, HLA-B27 and hsCRP positivity, smoking (ever smoker vs. no smoker), spinal pain (yes vs. no in last 3 months), body mass index (BMI) categories (WHO definition), physically demanding job, and giving birth within the last 12 month with the severity of BME were examined. Associations between clinical factors and the Berlin MRI score were analyzed by negative binomial regression models resulting in incidence rate ratios (IRRs).

Results: MRIs of 793 volunteers from the general population, mean age 37.3±6.3 years, 49.4% male, 8.9% HLA B27+, 7% CRP-positive, 56.9% with back pain in the last 3 months (28.8% with back pain NRS ≥4/10), 35.7% reported physically heavy work, 55% with BMI > 25 kg/m², 16.2% current smokers, and 5% of females with pregnancy in the last year before MRI examination, were evaluated.

For BME on SIJ-MRIs, significant associations (IRR, 95% confidence level) were found for pregnancy in the last year (3.82, 1.17-14.24), HLA-B27+ (2.42, 1.33-4.55), BMI (25-30 vs. <25; 2.09 (1.33-3.31)) and presence of back pain in the last 3 months (1.54, 1.02-2.33).

For BME on spinal MRIs, significant associations were found for age per decade increase (1.45, 1.10-1.91) and physically demanding work (1.45, 1.04-2.00), while HLA-B27+ (1.32, 0.79-2.24), BMI (>30: 0.84, 0.53-1.32 (<25 reference)) and back pain in the last 3 months (1.29, 0.95-1.77) showed no association. Overall, spinal BME was more frequent than SIJ BME in the participants working at a desktop (61.5% vs. 54.4%), while smokers (66.9% vs. 63.8%) and participants with back pain in the last 3 months (62.5% vs. 56.9%) had more often SIJ BME than spinal BME, respectively.

Conclusion: In this population-based study, individuals aged <45 years, HLA-B27+, women with pregnancy in the last year and presence of back pain were associated with the extent of BME in the SIJ, while age and physically demanding work were associated with the extent of BME in the spine. These data support the hypothesis of a mechanic origin of BME in the general population aged <45 years, while HLA B27 is a severity but not a susceptibility factor for BME in the SIJ.

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