Center register of safety of ICI for collecting patients treated with an ICI and who developed symptoms of arthritis with diagnosis of RA.
Results: We report 6 patients without any previous rheumatic disease, who developed seropositive rheumatoid arthritis (RA) after exposition to ICIs, all of them after anti-PD1.
Conclusions: This is the first description of RA occurring after anti-PD1 treatment for cancer. All cases responded to corticosteroids or with immunosuppressive therapy. This suggests that the PD1/PDL1 axis plays a role in RA pathophysiology. The combined expertise of oncologists, immunologists and rheumatologists is crucial in the successful management of these patients.
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Disclosure of Interest: None declared
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Fibromyalgia: a disease of the peripheral or central nervous system

OP0005 FIBROMYALGIA IN PATIENTS WITH RHEUMATOID ARTHRITIS IN A 10-YEAR PERSPECTIVE

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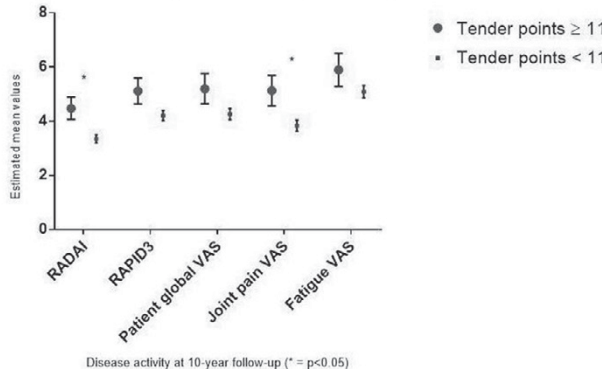
Background: Approximately 10% of patients with rheumatoid arthritis (RA) have coexisting fibromyalgia (FM). Little is known of the cross-sectional and longitudinal relationship between FM and RA disease activity.
Objectives: To examine the cross-sectional and longitudinal relationship between FM and RA disease activity.
Methods: Oslo RA register (ORAR) was established in 1994 as a prospective, observational, longitudinal nested cohort study. The inclusion criteria were RA according to the 1987-ACR classification criteria and a residential address in Oslo. 636 patients in ORAR were asked to participate in a clinical examination in 1999. A trained study-nurse systematically assessed the 18-tender point count and performed 28-tender and 28-swollen joint counts (TJC/SJC). Patients self-reported disease activity and pain related to RA, and completed the Stanford Health Assessment Questionnaire (HAQ). RA disease activity was calculated as DAS28. Fibromyalgia was diagnosed if $\geq$11 tender points were reported. FM associated variables; fatigue, muscular tenderness, headache, abdominal pain and difficulties concentrating were also scored (0–10 VAS).
At the 10-year follow-up patients completed a questionnaire that included RA Disease Activity Index (RADAI) and Routine Assessment of Patient Index Data (RAPID-3).
In cross-sectional and longitudinal analyses RA disease activity, FM associated variables and health status were compared between patients with $\geq$11 and $<$11 tender points. Level of significance was calculated using ANCOVA models corrected for age, gender, BMI and level of education. The FM associated variables at baseline were also corrected for baseline SJC 28 and C-reactive protein (CRP). The variables in the longitudinal study were corrected for the same variables as the cross-sectional analyses, but additionally for baseline values of the dependent variable when available.
Results: 488 patients agreed to participate in the baseline data-collection and 192 participated at the 10-year follow-up. The mean (SD) age was 59.5 (12.5) years, and 87% were female. There were no significant differences in age, disease duration or participation at follow-up between patients with and without FM, but only women had FM.
Patients with FM in addition to RA had higher DAS28, SJC, TJC, pain and patient global VAS, but also higher levels of fatigue, abdominal pain and concentration difficulties (table 1).

Table 1. Baseline cross-sectional associations

Variables Tender points $\geq$11 Mean (SD)	Tender joint count $<$11 n=40	Adj. Bivariate n=440	p
RA disease activity			
RA disease duration (years)	16.3 (8.9)	14.9 (9.3)	0.31
CRP (mg/L)	17.4 (24.4)	14.5 (13.4)	0.08
DAS28	5.3 (1.0)	4.4 (1.3)	0.002
PainVAS	4.5 (2.2)	3.5 (2.3)	0.03
SJC	9.8 (5.7)	6.8 (5.1)	0.04
TJC	13.3 (5.6)	7.4 (6.5)	$<$0.001
Patient disease activity VAS	4.7 (2.2)	3.7 (2.3)	0.03
Fibromyalgia related variables			
Muscular tenderness VAS	5.9 (2.7)	3.2 (2.6)	$<$0.001
Fatigue VAS	6.6 (2.7)	4.4 (2.7)	$<$0.001
Headache VAS	2.0 (2.4)	1.4 (2.1)	0.25
Abdominal pain VAS	3.7 (3.5)	1.9 (2.3)	$<$0.001
Difficulty concentrating VAS	2.9 (2.7)	1.7 (1.1)	0.003
Health Status			
HAQ	1.2 (0.1)	1.0 (0.0)	0.09

At the 10-year follow-up patient with FM had significantly higher levels of RA disease activity and pain (figure 1).

Figure 1 Longitudinal analyses
Disease activity at 10-year follow-up grouped according to baseline presence of FM



Conclusions: Presence of FM in patients with RA was associated with significantly higher levels of RA disease activity both in the cross-sectional and longitudinal perspectives. Secondary FM should be considered in patients with RA not reaching remission.
Disclosure of Interest: None declared
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OP0006 INFLUENCE OF AUTONOMIC NERVOUS SYSTEM DYSFUNCTION IN THE GENESIS OF SLEEP DISORDERS IN FIBROMYALGIA PATIENTS

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Background: Fibromyalgia (FM) is characterised by chronic musculoskeletal pain, autonomic nervous system (ANS) dysfunction, and disturbed sleep.
Objectives: The aim of this study was to evaluate the influence of ANS dysfunction on the genesis of sleep disorders.
Methods: Fifty consecutive Caucasian women (age 51.2±7.3 years) whose FM had been diagnosed on the basis of the 2010 ACR classification criteria were compared with 45 healthy female controls matched for age and body mass index.All of the FM patients underwent a clinical, polysomnographic and autonomic profile evaluation at rest and during a tilt test to determine muscle sympathetic nerve activity (MSNA), plasma catecholamine levels, and the spectral indices of cardiac sympathetic (LF_{RR}) and vagal (HF_{RR}) modulation computed by means of the spectrum analysis of RR during sleep.
Results: The FM patients had more tender points ($p<0.001$), a higher ESS score ($p<0.001$), and more signs and symptoms of orthostatic intolerance ($p<0.001$) than the controls. They also had a higher heart rate (HR), more MSNA and a higher LF/HF ratio, and lower HF_{RR} values at rest. The increase in tilting-induced MSNA was less in the FM patients (2±1 *vs* 16±3.1 bursts/min, $p<0.05$; 2±1 *vs* 12±2.8 bursts/100 $p<0.05$), whereas the trend in the spectral indices of the cardiac autonomic profile (LF_{RR} and the LF/HF ratio) and plasma catecholamine levels were similar in the two groups; furthermore, the decrease in the index of cardiac vagal modulation (HF_{RR}) was also less in the patients (HF_{RR}NU -17.3±3.2 *vs* -32.4±4.8, $p<0.05$; $HF_{RR}ms^2$ -148±50 *vs* -857±374, $p<0.05$). The stepwise tilt induced syncope or pre-syncope in 23 of the 50 patients (46%) and two of the 45 controls (5%) ($p<0.001$),Their sleep was less efficient ($p<0.01$), and they had a higher proportion of stage 1 non-REM sleep ($p<0.001$), experienced many arousals and periodic limb movements (PLMs) per hour of sleep ($p<0.001$) and a high proportion of periodic breathing (PB%) ($p<0.0001$). Their cyclic alternating pattern (CAP) rate was significantly increased ($p<0.001$).During sleep, the patients had a higher HR, and LF/HF ratio, and lower HF_{RR}, differences that were more marked during non-REM sleep, as were the presence of CAP, PB and PLMs. PLMs were mainly observed during CAP subtype A2 and A3. As in the tilt test, there was also a decrease in the index of cardiac vagal modulation during sleep: the decrease in HR_{RR} during sleep and in comparison when awake was less in the FMS patients than the controls (11.6±4.2 *vs* 31.1±5.3 NUs, $p<0.01$; 45±38 *vs* 403±281 ms^2, $p<0.0001$)
The number of tender points, pain VAS, the CAP rate, the PB% of sleeping time and the PLMI all seemed to correlate positively with HR and the LF/HF ratio, and negatively with HF_{RR} during sleep
Conclusions: Our data confirm that the FM patients have an autonomic nervous system dysfunction that is consistent with sympathetic over-activity due to the

intensity of chronic pain when awake and during sleep. These findings explain the excessive rate of syncope observed in the FM population during wakefulness, and the increased presence of CAP, PB and PLMs during sleep.
Disclosure of Interest: None declared
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Chondrocyte channels (role in mechanotransduction) or "channeling the chondrocyte"

OP0007 CCR2 INHIBITION ABROGATES IL-6–INDUCED ACTIVATION OF MATRIX METALLOPROTEINASES IN CARTILAGE

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Background: Interleukin 6 (IL-6) plays a crucial role in many rheumatic diseases, including osteoarthritis (OA) [1]. In cartilage, IL-6 activates chondrocyte catabolism by increasing the production of matrix-degrading enzymes, including matrix metalloproteinase 3 (MMP-3) and MMP-13, but it could have other roles.
Objectives: We aimed to identify new biological processes regulated by IL-6 in cartilage.
Methods: RNA-seq analysis (Illumina HiSeq platform) was used to determine biological pathways associated with IL-6/IL-6R (100 ng/ml) stimulation in mouse primary articular chondrocytes. Results were further validated by qPCR and western blot analysis. The effect of stimulation with CC chemokine ligand 2 (CCL2; 10 ng/ml), CCL7 and CCL8 (100 ng/ml) was investigated *in vitro* and *ex vivo* in mouse femoral head cartilage explants. The impact of targeted inhibition of CCL2 or CCL7 by siRNA or blockade of their common receptor CCR2 by a specific antagonist (RS-504393) was determined in IL-6–treated chondrocytes and/or cartilage explants.
Results: Transcriptomic analysis revealed overrepresentation of multiple functional clusters of genes in IL-6–stimulated chondrocytes, with strongly increased expression of signalling molecules and especially cytokines. Two of the 10 top genes upregulated by IL-6 were *Ccl7* (log2 fold change [FC] 2.33, adjusted p-value [p_{adj}] =3.35x10^{-62}) and *Ccl2* (log2 FC 1.85, p_{adj} =9.10x10^{-26}), which encode for CCR2 ligands. qPCR and western blot validations confirmed these results and revealed that IL-6 stimulation also increased the mRNA level of *Ccl8*, another CCR2 ligand not identified by RNA-seq analysis. CCL2 and CCL7 but not CCL8 activated extracellular signal-regulated kinase 1/2 and c-Jun N-terminal kinase signalling and increased MMP-3 and MMP-13 production and activation. CCR2 blockade but not the specific inhibition of CCL2 or CCL7 by siRNA, greatly abrogated the IL-6–induced catabolism *in vitro* and *ex vivo*.
Conclusions: We identified 2 chemokines, CCL2 and CCL7, as key targets of IL-6 in chondrocytes. Although their main role is to mediate monocyte/macrophage recruitment to the joint, their receptor, CCR2, is also strongly involved in IL-6–induced cartilage catabolism. These results suggest a novel mechanism by which CCL2/CCR2 and CCL7/CCR2 signalling could be involved in rheumatic diseases, especially OA [2].
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OP0008 DEFICIENT AUTOPHAGY INDUCES CHONDROCYTE DYSFUNCTION THROUGH LAMIN A/C ACCUMULATION IN AGING AND OSTEOARTHRITIS

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Background: Aging-related Osteoarthritis (OA) is characterized by insufficient extracellular matrix synthesis and articular cartilage degradation. Autophagy is essential to maintain chondrocyte homeostasis by regulating the intracellular macromolecule and organelle turnover (1). Previous findings indicated that autophagy is defective in Aging and OA articular cartilage (2,3). However, the specific target/-s that regulates this homeostatic mechanism and affect cartilage integrity are still unknown.
Objectives: The objective of study is to identify targets regulating autophagy in human chondrocytes.
Methods: We performed quantitative proteomic analysis of Atg5 knockdown primary uman chondrocytes using iTRAQ (isobaric tags for relative and absolute quantitation) labeling coupled with on-line 2D LC/MS/MS. Protein identification and quantification were performed using Protein Pilot Software v 4.0. Each MS/MS spectrum was searched in the Uniprot/Swissprot database for *Homo sapiens*. Human chondrocytes and human cartilage from healthy, aged and OA patients were employed to confirm the role of the identified target by Western Blot (WB), Inmunofluorescence (IF) and Inmunohistochemistry (IHC). Importanly, CRISPR/Cas9 genome editing technology was used for mechanism of action studies.
Results: 24 out of 487 proteins were significantly altered ($p<0.05$) in response to defective autophagy. Cytoskeleton organization, collagen catabolism, oxidative stress, and aging pathways were affected. Interestingly, Lamin A/C, a nuclear protein implicated in cell senescence, was found upregulated under defective autophagy. Increased Lamin A/C expression was found in human chondrocytes with reduced autophagy. Furthermore, aged and OA human cartilage showed increased Lamin A/C expression. Induction of chondrocyte senescence by genetic deletion of Zinc Metalloproteinase STE24 (Zmpste24) via CRISPR-Cas9, lead to Lamin A/C accumulation, accompanied by a reduction of LC3 and increased chondrocyte death and mitochondrial dysfunction, suggesting that deficient autophagy is correlated with senescence of human articular cartilage.
Conclusions: Lamin A/C, a nuclear protein contributing to structural integrity to the nucleus and matrix was identified as candidate target for regulating cartilage function under defective autophagy, such as aging and OA. These results support the hypothesis that autophagy is decreased with aging. Therefore, targeting Lamin A/C might be a promising strategy to find novel therapeutics for cartilage aging and OA.
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Wearable technologies in 21st century healthcare

OP0009-HPR THE EFFECT OF AN 8-WEEK WATER EXERCISE PROGRAM ON ANAEROBIC EXERCISE CAPACITY IN CHILDREN WITH JUVENILE IDIOPATHIC ARTHRITIS

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Background: Anaerobic exercise capacity was reported to be lower in children with juvenile idiopathic arthritis (JIA) than healthy children. However, to our knowledge, there is no study focusing on improving anaerobic exercise capacity in JIA.
Objectives: To investigate the effect of an 8-week water exercise program, which was performed at the weekends, on anaerobic exercise capacity in children with JIA.
Methods: Forty-two children with JIA were divided into two groups as exercise and control. Prior to the study, anaerobic exercise capacity was measured performing a 30-second Wingate test. Deep water running was employed as the progressive water exercise program for the exercise group. Control group did not receive any additional treatment other than their usual care. Weekends were chosen for the exercise sessions considering the educational program of the children. Exercise intensity was set as moderate. Exercise intensity was determined with a wearable heart rate tracking system during the exercises. All children were reassessed regarding to anaerobic exercise capacity two months after the first assessment.
Results: All children completed the study without any adverse effects. Twenty-one children were in the exercise group, others were assessed as controls. No significant differences were determined between groups prior the study regarding to age, disease duration, height, weight, body-mass index, and anaerobic exercise capacity related parameters ($p<0.05$). While all anaerobic exercise capacity parameters improved in the exercise group, no improvement were seen in the control group. The in-group comparisons were shown at Table 1. The comparison of the changes between groups after 8 weeks were demonstrated at Table 2.