Results: The definition of vitamin D sufficiency according to our reference laboratory is a 25(OH)D level of >75 nmol/L. Vitamin D status was checked in a total of 85 patients (53 female; 32 male). The mean age was 54.8 years (range: 19 - 86 years). A total of 90.6% patients showed inadequate levels of 25(OH)D (87.5% of males and 92.5% of females). 64.7% of patients had a 25(OH)D level < 50 nmol/L. 23.5% of the total had a 25(OH)D level < 30 nmol/L.
Conclusions: The vast majority of rheumatology outpatients complaining of polyarthralgia, polymyalgia or fatigue either as a primary diagnosis or secondary to their main rheumatological diagnosis had inadequate vitamin D levels. It should be noted that most of these results were obtained in early autumn when it might be expected that vitamin D levels would be at their peak. Almost a quarter of these patients had very low vitamin D levels (<30 nmol/L).
Disclosure statement: The authors have declared no conflicts of interest.

117. A COMPARATIVE STUDY OF RENAL DYSFUNCTION IN PATIENTS WITH RHEUMATOID ARTHRITIS AND SERONEGATIVE INFLAMMATORY ARTHRITIS: STRONG ASSOCIATION WITH CARDIOVASCULAR DISEASES AND NOT WITH ANTI-RHEUMATIC THERAPIES, INFLAMMATORY MARKERS OR DURATION OF ARTHRITIS

Muhammad Haroon[1], Fahd Adeeb[1], Joe Devlin[1], Donncha Ó Gradaigh[1] and Frank Walker[2]
[1]*Department of Rheumatology, Waterford Regional Hospital, Waterford, Ireland;* [2]*Department of Nephrology, Waterford Regional Hospital, Waterford, Ireland*

Background: Although, both rheumatoid arthritis and psoriatic arthritis run a chronic progressive disease course, these differ in a multitude of ways, such as, the anatomical localization of inflammatory lesions and extra-articular manifestations. In this study, we tested whether these obvious differences in disease characteristics are also reflected by differences in renal dysfunction. To study this in more detail, we performed a comparative study of the prevalence of CKD between comparable patients with RA and seronegative arthritis, and tried to explore any predictive factors for renal impairment.
Methods: Consecutive patients with peripheral joint disease (oligo and polyarthritis) were recruited from our inflammatory arthritis clinics. We divided patients in two groups: rheumatoid arthritis group and seronegative inflammatory arthritis group. The cohort consisted of 183 patients [RA = 107, Seronegative arthritis = 76 (Psoriatic arthritis = 69, undifferentiated oligoarthritis = 7)]. Estimated GFR was calculated using the established MDRD equation. Demographic details, disease specific characteristics, anti-rheumatic drugs, and the presence of cardiovascular diseases were recorded.
Results: In total, 17.48% (n = 32) of the cohort had CKD, and among them only 28% (9 out of 32) had a written diagnosis of CKD in their medical records and 94% (30 of 32) of these patients were using DMARDs, mainly methotrexate (65.6%, 21 out of 32). There was no statistically significant variation between two groups as regards baseline demographics, disease characteristics, use of anti-rheumatic drugs, and the presence of individual cardiovascular diseases. We found that eGFR and the presence of CKD were similar among these groups. Among patients with CKD, 72% had undiagnosed CKD. The mean age of patients with CKD did not differ significantly from patients with normal GFR (52.80 vs. 51.96 years, $p = 0.703$). CKD patients were more likely to have longer duration of the disease (mean 8.68 vs. 7.41 years, $p = 0.042$), and raised inflammatory markers (47% vs. 26%, $p = 0.018$). No association of statistical significance was noted between CKD and the use of corticosteroids, DMARDs and anti-TNF agents. The association of cardiovascular diseases with CKD remained significant after adjusting for confounders (age, gender, duration of arthritis, high CRP, use of anti-rheumatic drugs).
Conclusions: Patients with inflammatory arthritis are more prone to have CKD. This could have serious implications, as majority of rheumatology patients use NSAIDs and different immunosuppressives, such as methotrexate. No association of kidney dysfunction was noted with inflammatory disease-specific characteristics, rather it appears to have positive independent association with cardiovascular diseases
Disclosure statement: The authors have declared no conflicts of interest.

118. α_1-ANTITRYPSIN IN FIBROMYALGIA: RESULTS OF A RANDOMIZED, PLACEBO-CONTROLLED, DOUBLE-BLIND, AND CROSS-OVER PILOT TRIAL

Cayetano Alegre[1], Mireia Barceló[1], Rossend Jardí[2], Francisco Rodríguez[2], Laura Nuñez[3] and Sandra Camprubí[3]
[1]*Rheumatology Department, Hospital Vall d'Hebron, Barcelona, Spain;* [2]*Biochemistry Department, Hospital Vall d'Hebron, Barcelona, Spain;* [3]*Clinical Trials Department, Instituto Grifols, S.A., Barcelona, Spain*

Background: Current hypothesis of fibromyalgia (FM) aetiology includes neuroendocrine and inflammatory disorders. Several evidences suggest that α1-antitrypsin (AAT) might play role in controlling the inflammatory component of musculoskeletal connective tissue. The purpose of this study was to assess clinical effect of a human plasma-derived AAT concentrate in reducing pain severity of FM patients.
Methods: This was a unicenter, prospective, randomized, placebo-controlled, double-blind, and cross-over pilot trial (EudraCT number: 2005-004830-42). Subjects were randomly assigned to group A→B (to receive human AAT at a dose regimen of 60 mg/kg of body weight weekly) or group B→A (to receive equivalent volume of normal saline solution -placebo- weekly) for 9 weeks (treatment period 1). After a wash-out period of 6 weeks, the investigational products (IPs) were changed in a cross-over fashion for 9 weeks (treatment period 2). Finally, individuals were followed up during 6 weeks. All subjects were required to meet the American College of Rheumatology 1990 criteria for FM. Other treatments for FM were allowed, provided that these remained unchanged (up to 25% of daily doses) during the study. Primary efficacy endpoint was change on pain severity score, assessed by a daily visual analogue scale (VAS) for pain. Secondary outcome measures included tender points, Fibromyalgia Impact Questionnaire, Medical Outcomes Study Short Form 36, Health Assessment Questionnaire, Hospital Anxiety and Depression Scale, and daily VAS for tiredness. Safety was assessed by reporting of adverse drug reactions (ADRs).
Results: Thirteen adult individuals (mean age 47 years, mean duration of FM 7 years) were allocated in group A→B (n = 7) or group B→A (n = 6). Baseline demographics and clinical characteristics were comparable between treatment groups. None subject presented AAT congenital deficiency. All individuals receive concomitant medication during the clinical trial, in most cases due to self-medication. Mean change on the pain severity score in group A→B was 0.07 (SD = 1.13) and in group B→A was -0.85 (SD = 1.99). No statistically significant differences were observed in both groups: group A→B ($p = 0.90$) and B→A ($p = 0.40$). No statistically significant differences were revealed between treatment groups in both treatment periods: treatment period 1 ($p = 0.26$) and treatment period 2 ($p = 0.96$). Neither carryover effect nor order effect were observed. Changes on secondary outcomes did not evidence statistically significant differences between treatment groups and periods. Both IPs were well tolerated with a low incidence of only mild ADRs. No serious ADRs were reported.
Conclusions: In this pilot study, treatment with a human plasma-derived AAT concentrate did not demonstrate significant improvement over placebo on reducing pain severity and other symptoms of FM. Further research should examine other FM subpopulations and drug doses.
Disclosure statement: C.A. has received consultancy fees from Pfizer, Esteve, Jazz Pharmaceuticals and Grünenthal. S.C. and L.N. are employees of Instituto Grifols S.A. All other authors have declared no conflicts of interest.

Osteoarthritis

119. THE EFFECTIVENESS OF EXERCISE THERAPY WITH AND WITHOUT MANUAL THERAPY FOR HIP OSTEOARTHRITIS: A MULTICENTRE RANDOMISED CONTROLLED TRIAL

Helen French[1], Tara Cusack[2], Aisling Brennan[3], Martina Fitzpatrick[4], Aoife Caffrey[4], Clare Gilsenan[5], Vanessa Cuddy[5], Breon White[6], David Kane[7], Paul O'Connell[8], Oliver FitzGerald[9] and Geraldine M. McCarthy[10]
[1]*School of Physiotherapy, Royal College of Surgeons in Ireland, Dublin, Ireland;* [2]*School of Public Health, Physiotherapy and Performance Science, University College Dublin, Dublin, Ireland;* [3]*Physiotherapy, Adelaide, Meath hospital (incorporating the National Children's Hospital), Dublin, Ireland;* [4]*Physiotherapy, St Vincent's University Hospital, Dublin, Ireland;* [5]*Physiotherapy, Beaumont hospital, Dublin, Ireland;* [6]*Physiotherapy, Mater Misericordiae University hospital, Dublin, Ireland;* [7]*Rheumatology, Adelaide, Meath*

hospital (incorporating the National Children's Hospital), Dublin, Ireland; [8]Rheumatology, Beaumont hospital, Dublin, Ireland; [9]Rheumatology, St Vincent's University hospital, Dublin, Ireland; [10]Rheumatology, Mater Misericordiae University Hospital, Dublin, Ireland

Background: Current evidence indicates that exercise therapy (ET) has a short and medium-term benefit for hip osteoarthritis (OA), but evidence is inconclusive regarding the effect of manual therapy (MT). The primary aim of this randomised controlled trial was to determine the effectiveness of ET with and without MT on clinical outcomes for individuals with hip OA. A secondary aim was to ascertain the effect of an 8-week waiting period on outcomes.
Methods: 131 men and women with hip OA recruited in four hospitals were initially randomised to one of three groups: ET (n = 45), a combination of ET and MT (n = 43) and wait-list control (n = 43). The two intervention groups underwent individualised ET or ET/MT for 8 weeks. Patients in the control group waited 8 weeks and were randomised to receive either ET or ET/MT after 9 week follow-up, and pooled with original treatment group data: ET (n = 66) and ET/ MT (n = 65). All participants were followed up at 9 and 18 weeks and the control group was reassessed at 27 weeks (18 weeks post-treatment) by the same blinded assessor. The primary outcome measure was the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Other outcomes included sit-to-stand, 50-foot walk test, pain severity, hip range of motion (ROM), anxiety, depression, quality of life (QOL), analgesic usage, physical activity, patient-perceived change and patient satisfaction. Intention-to-treat analysis was performed to determine within-group change and between-group differences for the three groups at baseline and 9 weeks, and the two treatment groups at baseline, 9 and 18 weeks.
Results: Eight patients (6.1%) were lost to follow-up at 9 weeks and 19 (14.5%) were lost to follow-up by 18 weeks. Both ET (n = 66) and ET/MT groups (n = 65) showed significant within-group improvements in WOMAC, pain severity, sit-to-stand and HROM measures at 9 weeks, which were still evident at 18 weeks. There was no significant within-group change in anxiety, depression, QOL, analgesic usage, 50-foot walk test or physical activity. There was no significant difference between the two intervention groups for any of the outcomes.

Regarding the results of the original ET, ET/MT and control group allocation, there was a significant improvement in one or both ET and ET/MT groups compared with the control group in the same outcomes, as well as patient perceived improvement at 9 weeks. There was no significant difference between the three groups in analgesic usage, WOMAC stiffness subscale, sit-to-stand and 50 foot walk tests, QOL and physical activity. There was an overall deterioration in anxiety and depression scores.
Conclusions: The addition of MT to an 8 week programme of ET for hip OA resulted in similar improvements in pain, function and ROM at 9 and 18 weeks. The significant improvement which occurred in the same outcomes in the two treatment groups compared with a wait-list control of 8 weeks has implications for waiting list management
Disclosure statement: The authors have declared no conflicts of interest.

120. PREVALENCE AND INCIDENCE OF HIP OSTEOARTHRITIS IDENTIFIED FROM DUAL ENERGY XRAY ABSORPTIOMETRY IMAGES IN THE AUCKLAND CALCIUM STUDY COHORT

Kanako Yoshida[1], Jennifer S. Gregory[1], Barbara Mason[2], Ian Reid[2] and David M. Reid[1]
[1]*Division of Applied Medicine, University of Aberdeen, Aberdeen, United Kingdom;* [2]*Faculty of Medical and Health Sciences, University of Auckland, Auckland, New Zealand*

Background: Osteoarthritis (OA) and osteoporosis are the two most common musculoskeletal diseases in the aging population and its relationship has long been debated. Dual energy Xray absorptiometry (DXA) scanners are used to assess osteoporosis, but recently, DXA images have also been shown to adequately assess OA. The purpose of this study was to assess the prevalence and incidence of hip OA (HOA) based on DXA images in a large study cohort from New Zealand.
Methods: DXA scans of the hip (Lunar Expert, GE) taken at 30 month intervals over 5 years from postmenopausal women participating the Auckland Calcium Study were scored for the presence of HOA using Kellgren Lawrence grades (KL). Images from the each subject were visualised simultaneously, and the reader blinded to the scan order. Progression was defined as follows: KL change of ≥1 grade, or if the change detected was ≤1 KL grade, by correct sequential ordering of images.
Results: 1420/1471 subjects had baseline hip DXA images available of adequate quality to assess prevalence. Of those, HOA (KL≥2) was present in 8.45% at baseline. Of the 1,187 subjects who had ≥2 DXA scans, 13.5% were classified as having progressed by the study criteria. Incident new HOA was 2.3% and 4.8% for 2.5 year and 5 year follow-up respectively.
Conclusions: The prevalence and incidence of HOA determined by DXA were comparable to those published in literature for radiographs. DXA may have a role in monitoring hip osteoarthritis in studies of osteoporosis/fracture risk.
Disclosure statement: The authors have declared no conflicts of interest.

121. USING THE NATURAL HISTORY OF LOWER LIMB PAIN TO IDENTIFY NOVEL PHENOTYPES IN OSTEOARTHRITIS

Anushka Soni[1], Eveline Nüesch[2], Peter Juni[2], Stephan Reichenbach[2] and Paul Dieppe[3]
[1]*Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Oxford, United Kingdom;* [2]*Division of Clinical Epidemiology and Biostatistics, Institute of Social and Preventive Medicine, University of Bern, Bern, Switzerland;* [3]*Institute of Clinical Education Research, Peninsula Medical School, Universities of Exeter and Plymouth, Plymouth, United Kingdom*

Background: It is widely accepted that osteoarthritis (OA) is a heterogeneous condition and the value of epidemiological data to identify clinically relevant phenotypes, to improve both understanding of aetiology and management, has been recently highlighted [1]. A recent study of short-term consistency of knee pain has revealed patient subgroups with different characteristics [2], but little research has focused on long-term patterns of both hip and knee pain.The aim of this study was describe to the different phenotypes of hip and knee pain over 8 years, in a population-based cohort of patients reporting lower limb pain at the point of screening.
Methods: 1275 subjects (772 females, age 35-85yrs at baseline) reporting lower limb pain on initial screening, with follow-up pain data at 8 years were selected from the SASH cohort, a population-based study of 28 080 people randomly selected from 40 general practices in the south-west of England. The patterns of joint involvement taking account of baseline, follow-up and overall change over time were described.
Results: Frequencies of static patterns of pain were (baseline n (%), follow-up n (%)): none (527(41), 310(24%)), unilateral knee (250(20), 140(11)), unilateral hip (136(11), 73(6)), contralateral hip and knee (11(1), 26(2)), bilateral knee (193(15), 202(16)), bilateral hip (33(3), 55(4)), ipsilateral hip and knee (53(4), 130(10)), three joints (48(4), 134(11)), four joints (24(2), 205(16)). The change in patterns of pain over time are summarised in Table 1.
Conclusions: This is the first study to describe long-term longitudinal change in hip and knee pain. Several potential pain phenotypes have emerged and may be associated with different predictors, which would aid understanding of aetiology and inform management. Further validation is needed in other cohorts.
Disclosure statement: The authors have declared no conflicts of interest.

TABLE 1. Change in pain pattern over 8 years

Pain pattern	N (%)
No joint pain	154 (13)
Stable unilateral or bilateral knee pain	113 (9)
Unilateral knee or hip pain becoming bilateral	63 (5)
New onset unilateral hip or knee pain	98 (8)
New onset bilateral hip or knee pain	92 (7)
Unilateral hip or knee pain	100 (8)
Four painful joints with none or single joint involvement at baseline	110 (9)
Resolved unilateral or bilateral hip or knee pain	101 (8)
Other pattern of reduced joint involvement	113 (9)
Other stable number of painful joints	97 (8)
Other increasing number of painful joints	234 (19)

References

1. Felson DT. Identifying different osteoarthritis phenotypes through epidemiology. Osteoarthritis Cartilage 2010;18:601–4.
2. Neogi T et al. Consistency of knee pain: correlates and association with function. Osteoarthritis Cartilage18(10):1250–5.

122. CHONDROCYTE CRF RECEPTOR EXPRESSION AND UROCORTIN I MEDIATED CHONDROPROTECTION

Omeco B. White[1], Nabila Y. Intekhab-Alam[1], Hardial S. Chowdrey[1], Richard A. Knight[2] and Ian C. Locke[1]
[1]*Department of Biomedical Science, University of Westminster, London, United Kingdom;* [2]*Department of Molecular Pathology, University College London, London, United Kingdom*

Background: Nitric Oxide (NO) has been implicated in the pathology of Osteoarthritis (OA) through the induction of chondrocyte apoptosis. Several studies have demonstrated raised levels of NO in Osteoarthritic cartilage suggesting that agents which protect against NO-induced mitochondrial injury may have therapeutic potential. We have previously demonstrated the production of Urocortin (Ucn I) in a human chondrocyte cell line following treatment with various pro-apoptotic stimuli and further shown that the exogenous administration of Ucn I protects chondrocytes from NO induced apoptosis. The current study demonstrates the expression of functional CRF receptor variants and indicates the presence of possible intracellular mechanisms through which Ucn may exert its chondroprotective effect.
Methods: Monolayer cultures of C-20/A4 cells were maintained in a Dulbecco's MEM (DMEM) - based medium containing 10% foetal calf serum (FCS) at 37°C and 5% CO2. Flasks were allowed to reach ~80% confluency, serum-starved overnight in 1% FCS DMEM then treated with the NO donor SNAP, Ucn I and α-helical CRH (a CRFR antagonist) for 6 hours. CRFR and KATP channel subunit expression were analysed by RT-PCR and p42/p44 MAPK activation studied by western blotting. Apoptotic cell death was assessed by Annexin V/PI binding and TUNEL assay with necrosis assessed by LDH release.
Results: An increase in chondrocyte apoptosis was observed following treatment of C-20/A4 cells with SNAP. Co-treatment with Ucn I resulted in a decrease in apoptosis which was abrogated following the addition of αhCRH suggesting the presence of CRF receptor mediated protection in these cells. RT-PCR experiments confirmed the expression of both CRFR1 and CRFR2 mRNA, specifically the CRFR1α and CRFR2β splice variants, by C-20/A4 chondrocytes. The mRNA expression of both Kir and SUR subunits of the mitochondrial ATP sensitive inwardly rectifying potassium channel were also demonstrated. Western blotting demonstrated a Ucn mediated increase in p42/44 MAPK activation.
Conclusions: Inhibition studies with αhCRH and RT-PCR analysis of CRFR expression indicate the presence of two active forms of CRFR, CRFR1α and CRFR2β by C-20/A4 chondrocytes. The observation that these cells express both CRFR1 and CRFR2 is novel in that CRFR1 are largely confined to the central nervous system in humans, but would explain the greater potency of Ucn I in chondroprotection as this peptide binds to both CRFR1 and CRFR2 whilst Ucn II and Ucn III are selective CRFR2 ligands. These receptors provide a putative cell surface binding site for Ucn family members to exert their cytoprotective effects which may be mediated through a mechanism involving Kir 6.1-containing mitochondrial potassium channels. Moreover, the activation of the p42/44 MAPK in C20-A4 cells following Ucn treatment also suggest the involvement of other cytoprotective mechanisms (e.g. cAMP and PKA modulated responses) in Ucn mediated chondroprotection.
Disclosure statement: The authors have declared no conflicts of interest.

123. AN OPEN-LABEL STUDY USING METHOTREXATE TO TREAT PAINFUL KNEE OSTEOARTHRITIS

Claire Wenham[1,2], Andrew J. Grainger[1,3], Elizabeth M. Hensor[2] and Philip Conaghan[1,2]
[1]*NIHR Leeds Musculoskeletal Biomedical Research Unit, Leeds Institute of Molecular Medicine, Leeds, United Kingdom;* [2]*Section of Musculoskeletal Disease, Chapel Allerton Hospital, Leeds, Leeds Institute of Molecular Medicine, University of Leeds, Leeds, United Kingdom;* [3]*Department of Musculoskeletal Radiology, Leeds Teaching Hospitals Trust, Leeds, United Kingdom*

Background: Osteoarthritis (OA) is the most common arthritis worldwide and causes significant pain and disability. Current treatments including NSAIDs and opioids have significant side-effects. There is an urgent need for safe, long-term treatments for pain in OA. Recent imaging studies have demonstrated that synovitis is very common in OA of the knee and strongly associated with pain. Methotrexate (MTX) is a safe and effective treatment for synovitis with good efficacy and long-term safety in inflammatory arthritides. This 24-week open-label study evaluated the effectiveness of methotrexate at pain reduction in knee OA. We also assessed ultrasound-detected synovitis.
Methods: Inclusion criteria included pain VAS >40/100 mm in the last 3 months, ACR clinical criteria for OA, radiographic evidence of OA and no inflammatory arthritis. Ultrasound at baseline and 24 weeks assessed effusion and synovial thickness (mm) in 3 compartments of the knee. Patients received methotrexate up to 20 mg per week for 24 weeks. Validated questionnaires assessed response to treatment.
Results: 30 patients were recruited; 86.7% female, mean (range) age 64.5 (53 to 85), median (range) disease duration 39 months (6 to 122), median baseline pain VAS (IQR) 68 mm (44). 4 withdrew with side-effects and 2 with inefficacy. At 12 weeks 10/20 (50%) patients had achieved a 20% reduction in 48 hr pain VAS. Seven patients (35%) achieved at least a 40% reduction in pain VAS. At 24 weeks 8/13 (61.5%) had achieved a 20% reduction; 5 (25%) had achieved a 40% reduction; 3 patients (15%) had experienced a flare. Using non parametric Wilcoxon tests, at 24 weeks there was a median (IQR) improvement in 48 hr pain VAS of -21 mm (55.5) ($Z = -0.91$), a median (IQR) improvement in patient disease activity VAS of -26 mm (43) ($Z = -2.59$) and a median improvement in physician disease activity VAS of -13.5 mm (48.3) ($Z = -1.37$). Imaging: All patients had synovitis (effusion or synovial hypertrophy) at baseline (22/30 demonstrated both pathologies). At baseline there were no clear associations between synovitis and pain or effusion and pain. At 24 weeks a median (IQR) change in total synovial thickness of −2.6 mm (3.2) and a change in total effusion score of −1.8 mm (5.4) were noted. At 24 weeks the change in pain VAS was not substantively associated with total effusion but there was some evidence of an association with the maximum compartment score ($rho = -0.462$, $p = 0.112$, $n = 13$). There was no significant association between change in baseline pain VAS at 24 weeks and baseline total synovitis (total $rho = 0.115$, $p = 0.707$, $n = 13$).
Conclusions: As expected, ultrasound-detected synovitis at baseline was prevalent in all patients. Preliminary results of this small, open label study suggest good efficacy for MTX at pain reduction in OA knee patients and a large randomised controlled trial is now warranted.
Disclosure statement: The authors have declared no conflicts of interest.

124. PREVALENCE OF ULTRASOUND-DEFINED HAND, KNEE AND HIP OSTEOARTHRITIS AT AGE 63: ISOLATED HAND OSTEOARTHRITIS IS COMMON AND MAY PREDICT KNEE AND HIP INVOLVEMENT

Ajay Abraham[1,2], Mark S. Pearce[1], Roger M. Francis[3,4] and Fraser Birrell[2,5]
[1]*Institute of Health & Society, Newcastle University, Newcastle upon Tyne, United Kingdom;* [2]*Rheumatology, Northumbria Healthcare NHS Foundation Trust, Newcastle upon Tyne, United Kingdom;* [3]*Institute of Ageing & Health, Newcastle University, Newcastle upon Tyne, United Kingdom;* [4]*Musculoskeletal Unit, Newcastle Hospitals NHS Foundation Trust, Newcastle upon Tyne, United Kingdom;* [5]*Musculoskeletal Research Group, Institute of Cellular Medicine, Newcastle University, Newcastle upon Tyne, United Kingdom*

Background: Radiographs are currently the main imaging modality used in epidemiological studies of osteoarthritis (OA). However, musculoskeletal ultrasound has distinct advantages over radiographs, as it is more sensitive in the detection of osteophytes and can be used to assess joint inflammation.
Objective: To measure the prevalence of OA of the hand, knee and hip using ultrasound, among members of the Newcastle Thousand Families birth cohort
Methods: 268 participants from a community cohort aged 63 (born in May-June 1947), had the dominant hand, both knees and both hips scanned by a trained musculoskeletal sonographer (AA; Esaote Mylab 70 XVG). Protocols were derived from EULAR guidelines. The presence of knee osteophytes was assessed at the tibial and femoral sites, medially and laterally. Effusion size was measured in the longitudinal supra-patellar position. The hip was imaged in the anterior longitudinal plane and images scored for presence of osteophytes and femoral head shape. The first CMC joint and MCP, PIP and DIP joints of the index finger (dominant hand) were imaged for osteophytes in a multiplanar manner.
Results: Prevalence of osteophytes in the dominant hand was high at the DIP joint at 70.5% while it was 25.3%, 11.2% and 39.5% for index PIP, index MCP and thumb base CMC joints, respectively. Hand OA prevalence was higher among females compared to males ($p = 0.005$, $\chi 2$). Prevalence of knee osteophytes was 21.3%, 22.8% and 27.6% for right, left and ''any'' knee, respectively. There was no significant difference of knee osteophyte prevalence between males and females ($p = 0.8$, $\chi 2$). The prevalence of knee effusions was 24.2% and 19.8% in right and left knees, respectively; with males showing a non-significant trend towards higher prevalence than females ($p = 0.1$, $\chi 2$).

The prevalence of hip OA was higher than described in radiographic surveys, with 29.5%, 32.8% and 43.7% in right, left and ''any'' hip, respectively. Males had a non-significant trend towards higher prevalence of hip OA, ($p = 0.2$, $\chi 2$). Generalised OA was defined as hand OA plus knee and/or hip OA. Ultrasound evidence of generalised OA (48%) and isolated hand OA (31%) were common, compared to isolated hip or knee OA (5%) and both hip and knee OA (3%).
Conclusions: This is the first study to look at the prevalence of ultrasound defined OA in the community. The higher prevalence of OA in the hands and hips in this study, when compared to previous radiographic studies, adds evidence to the idea that ultrasound is more sensitive than radiographs in detecting OA, particularly for the presence of osteophytes. The high prevalence of isolated hand OA suggests that ultrasound defined hand OA may be a predictor of the development of generalised OA. A study of longitudinal risk factors for OA obtained prospectively in this cohort is underway.
Disclosure statement: The authors have declared no conflicts of interest.

125. PROTEASE-ACTIVATED RECEPTOR-2 (PAR-2) IN THE PATHOGENESIS OF OSTEOARTHRITIS

William R. Ferrell[1], Elizabeth B. Kelso[1], John C. Lockhart[2], Elizabeth Burns[2], Robin Plevin[3] and Iain B. McInnes[1]
[1]*Institute of Infection, Immunology & Inflammation, University of Glasgow, Glasgow, United Kingdom;* [2]*School of Science, University of the West of Scotland, Paisley, United Kingdom;* [3]*Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, United Kingdom*

Background: Osteoarthritis (OA) is a global clinical challenge for which no effective disease-modifying agents currently exist. Proteinase activated receptor-2 (PAR-2) is a cell surface receptor activated by proteolytic cleavage, revealing a tethered ligand which binds to extracellular loop 2 resulting in intracellular signalling. We previously demonstrated a role for PAR-2 in adjuvant (1) and rheumatoid arthritis (2). As increasing evidence points to an inflammatory component in OA (3), in the present study we tested the hypothesis that PAR-2 may play a role in the pathogenesis of OA.
Methods: Experimental osteoarthritis was induced in wild-type and PAR-2-deficient mice (C57Bl/6J background) by sectioning the medial menisco-tibial ligament. This leads to destabilization of the medial meniscus (DMM) and development of a mild arthropathy. Cartilage degradation and increased subchondral bone formation were assessed histologically as indicators of OA pathology. In separate cohorts of wild-type mice, PAR-2 activation was inhibited following DMM by either treating with a PAR-2 antagonist (p520), or a monoclonal antibody targeting the protease cleavage site of PAR-2 (SAM-11). An isotype antibody was administered in a further group as a control for SAM-11.
Results: Following DMM surgery, PAR-2 was upregulated in chondrocytes of wild-type but not sham-operated mice. Wild-type mice showed greater cartilage damage scores (26 ± 9, mean $\pm$ SEM, $n = 6$) and increased subchondral bone formation ($13.5 \pm 2.3\%$) compared to PAR-2 deficient mice (2.9 ± 0.5 and $1.8 \pm 2.4\%$ respectively, $n = 5$) four weeks following DMM ($P < 0.01$). Crucially, inhibition of PAR-2 in wild-type mice, using either p520 or SAM-11, was equally effective at reducing OA progression in vivo ($P < 0.01$). Wild-type mice showed further joint degradation 8 weeks after the induction of osteoarthritis, but PAR-2-deficient mice were still protected. Therapeutic intervention one week following DMM was also effective in preventing disease progression.
Conclusions: Studies in PAR-2 deficient mice provide proof of concept for a key role for PAR-2 in OA pathogenesis, whilst inhibition of PAR-2 activation following induction of OA affords substantial protection from cartilage and bone pathology. Together these findings support PAR-2 as a novel therapeutic target in treatment of OA.
Funding: This work was supported by Arthritis Research UK (17728, 18901).
Disclosure statement: The authors have declared no conflicts of interest.

References

1. Ferrell WR, Lockhart JC, Kelso EB et al. Essential role for proteinase-activated receptor-2 in arthritis. J Clin Invest 2003; 111:35–41.
2. Kelso EB, Ferrell WR, Lockhart JC et al. Expression and proinflammatory role of proteinase-activated receptor 2 in rheumatoid synovium: ex vivo studies using a novel proteinase-activated receptor 2 antagonist. Arth Rheum 2007;56:765–71.
3. Pelletier JP, Martel-Pelletier J, Abramson SB. Osteoarthritis, an inflammatory disease: potential implication for the selection of new therapeutic targets. Arthritis Rheum 2001;44:1237–47.

Paediatric and adolescent rheumatology

126. ENTHESITIS-RELATED ARTHRITIS: TWO DISTINCT CLINICAL PHENOTYPES?

Corinne Fisher[1], John Ioannou[1] and Debajit Sen[1]
[1]*Rheumatology, University College Hospital, London, United Kingdom*

Background: The ILAR classification criteria define enthesitis related arthritis (ERA) as a subtype of juvenile idiopathic arthritis. It is the subtype most similar to adult ankylosing spondylitis. Axial disease is said to be a late feature, with lower limb arthritis and enthesitis prominent early symptoms. There have been no observational studies since the development of the ILAR criteria. The aim of this study was to identify ERA patients with axial disease and compare their clinical characteristics to those with peripheral disease.
Methods: Patients with ERA were identified from those attending our adolescent rheumatology clinic. A retrospective case review was undertaken and a database of clinical manifestations, radiology and treatment compiled. A comparison of patients with confirmed axial disease on MRI scan ($n = 30$) and those with no axial disease ($n = 25$) was made.
Results: 55 patients (47 males, 8 females) with ERA were identified according to the ILAR diagnostic criteria for JIA. 39 (70.9%) had experienced inflammatory spinal pain, 15 (27.3%) at diagnosis. Average time to inflammatory back pain was 2 years 8 months. The average age of onset for those with axial disease was 11 years 7 months compared with 9 years 5 months for those without. Average duration of ERA was 7 years in the axial disease group and 8 years 10 months in the non-axial group. HLA B27 status was known in 42/55 patients and was positive in 89.5% with axial disease and only 52.2% with non-axial disease. Knee arthritis was common in both groups (73.3% and 80%). As expected, lumbar spine and SIJ symptoms were more common in the axial disease group (73.3% vs 36% and 73.3% vs 20% respectively). In addition, hip arthritis occurred more frequently in this group (70% vs 52%) and was common at presentation (40% vs 16%). In the non-axial disease group, ankle arthritis was frequent (84% vs 33.3%), occurring at presentation in 32% (vs 10%). Enthesitis and upper limb arthritis were also common in this group (68% vs 43.3% and 61.5% vs 41.3% respectively).Enthesitis occurred frequently at disease onset (20% vs 3.3%). Extra-articular manifestations were only found in patients with axial disease (3 iritis and 5 inflammatory bowel disease). A higher proprtion of the axial disease group were on anti-TNF therapy (48.3% vs 23.1%). Treatment with DMARD alone was more common with non-axial disease (65.4% vs 37.9%).
Conclusions: In this cohort, there appear to be two distinct phenotypes of ERA. The first are those with axial disease which appears to be associated with HLA B27, hip arthritis and extra-articular manifestations. This group developed ERA later and had a shorter disease duration than those without axial disease. A higher proportion needed anti-TNF therapy. In the second group, non-axial disease was associated with with ankle arthritis, enthesitis and upper limb symptoms. Further studies are needed to determine whether the presence or absence of certain clinical features in ERA predict the development of axial disease.
Disclosure statement: The authors have declared no conflicts of interest.

127. ADULTS WITH JUVENILE IDIOPATHIC ARTHRITIS ARE AT INCREASED CARDIOVASCULAR RISK

Iain Goff[1], Elizabeth Coulson[1] and Helen Foster[1,2]
[1]*Department of Rheumatology, Newcastle upon Tyne Hospitals NHS Trust, Newcastle upon Tyne, United Kingdom;* [2]*Newcastle Musculoskeletal Research Group, Newcastle University, Newcastle upon Tyne, United Kingdom*

Background: The increased prevalence of cardiovascular (CV) disease in adults with chronic inflammatory disease is well reported, is the leading cause of death in Rheumatoid arthritis (RA) and annual