based on semiquantitative MRI assessment and to determine their risk for progression over 48 months.

Methods: The FNIH was designed as a case-control study with knees showing either 1) radiographic and pain progression (i.e., "composite" cases), 2) radiographic progression only ("JSL"), 3) pain progression only, and 4) neither radiographic nor pain progression. MRI of both knees was performed on 3 T systems at the four OAI clinical sites. Two musculoskeletal radiologists read the baseline MRIs according to the MOAKS scoring system. Knees were stratified into subchondral bone, meniscus/cartilage and inflammatory phenotypes¹. A secondary, less stringent definition for inflammatory and meniscus/cartilage phenotype was used for sensitivity analyses. The relation of each phenotype to risk of being in the JSL or composite case group compared to those not having that phenotype was determined using conditional logistic regression. Only KL2 and 3 and those without root tears were included.

Results: 485 knees were included. 362 (75%) did not have any phenotype, while 95 (20%) had the bone phenotype, 22 (5%) the cartilage/meniscus phenotype and 19 (4%) the inflammatory phenotype. The bone phenotype was associated with a higher risk of the JSL and composite outcome (OR 1.81; 95%CI 1.14,2.85) and 1.65; 95%CI [1.04,2.61] while the inflammatory (OR 0.96 [95%CI 0.38,2.42] and 1.25; 95%CI [0.48,3.25]) and the meniscus/cartilage phenotypes were not (OR 1.30 95%CI [0.55,3.07] and 0.99; 95%CI [0.40,2.49]).

In sensitivity analyses, the bone phenotype and having two phenotypes (vs. none) were both associated with increased risk of experiencing the composite outcome (bone: OR 1.65; 95% CI 1.04, 2.61; 2 phenotypes: OR 1.87; 95% CI 1.11, 3.16).

Conclusion: The bone phenotype was associated with increased risk of having both radiographic and pain progression together, or radiographic progression alone, whereas the inflammatory phenotype or meniscus/cartilage phenotype each individually were not associated with either outcome. Phenotypic stratification appears to provide insights into risk for structural or composite structure plus pain progression, and therefore may be useful to consider when selecting patients for inclusion in clinical trials.

References:

- [1] Roemer FW, Collins J, Kwok CK, et al. MRI-based screening for structural definition of eligibility in clinical DMOAD trials: Rapid OsteoArthritis MRI Eligibility Score (ROAMES). *Osteoarthritis Cartilage* 2020;28(1):71-81

Disclosure of Interests: Frank Roemer: None declared, Jamie Collins Consultant of: Boston Imaging Core Lab (BICL), LLC., Tuhina Neogi Grant/research support from: Pfizer/Lilly, Consultant of: Pfizer/Lilly, EMD-Merck Serono, Novartis, Michel Crema: None declared, Ali Guermazi Consultant of: AventisGalapagos, Pfizer, Roche, AstraZeneca, Merck Serono, and TissuGene

DOI: 10.1136/annrheumdis-2020-eular.1802

FRI0422 HOW MANY OA PATIENTS WILL BE OVERTREATED IF TREATED WITH DMOADS? ANALYSIS OF OSTEOARTHRITIS INITIATIVE DATA

I. Shirinsky¹, V. Shirinsky¹. ¹Federal State Budgetary Scientific Institution Research Institute of Fundamental and Clinical Immunology, Novosibirsk, Russian Federation

Background: Significant research effort is currently put on discovering drugs able to slow structural progression of osteoarthritis (OA). In many patients OA shows little or no increase in pain or function deterioration over time. Thus, giving disease-modifying OA drugs (DMOAD) for long periods to this subset of patients can be considered as overtreatment. There is a lack of studies directly evaluating how many patients with diagnosed OA experience no impact of the disease during long-term follow up and thus probably do not need any disease modification.

Objectives: To assess proportions of patients with diagnosed symptomatic knee OA or frequent knee pain that does not result in sustained pain and limitation of function during long-term follow up.

Methods: For the current study we used 8-year longitudinal data obtained from the Osteoarthritis Initiative (OAI) progression (n= 1390) and incidence (n = 3284) subcohorts, which are publically available at <https://oai.nih.gov>. For the analyses we included knees having frequent knee symptoms in the past 12 months before the baseline for at least one month. Thus the analyzed group comprised patients fulfilling the definition of symptomatic knee OA (frequent symptoms + Kellgren-Lawrence (KL) grade ≥ II) and people who might have early OA (frequent symptoms + KL grade < II) in accordance with the proposed draft classification criteria [1].

The proportion of knees experiencing no impact of OA at the 8 years follow-up was assessed.

No impact of OA was defined if a knee fulfilled all the following criteria: 1. WOMAC pain score within normative values 2. WOMAC disability score within normative values 3. Absence of joint replacement.

We used previously reported reference population age and gender adjusted values for WOMAC knee pain and WOMAC knee function [2]. It is unlikely that any OA treatment is capable to improve WOMAC pain and function measures above these reference ranges in a given person [2].

Results: We included 3092 knees from 2147 participants in the analysis. The mean age of participants was 61.16 years, the mean BMI was 28.59. Almost half of symptomatic knees with baseline KL grades 0-I were not impacted by the disease at 8 year follow up. Every fifth knee with symptomatic knee OA (KL grades ≥ II) had no impact of the disease at the end of follow up. Every third knee with symptomatic KL grade II OA did not develop pain or disability outside the reference range. The percentage of symptom-free knees at year 8 declined progressively with higher KL grades (Table).

Table. Percentage of knees with no impact of OA on 8 year follow up depending on baseline KL grade.

Baseline KL grade	Total n of knees	Percentage of knees with no impact of OA
0	894	47 %
I	469	43.1%
II	923	31.31%
III	609	17.7%
IV	197	7.1%

Conclusion: If given DMOADs, a substantial proportion of OA patients would be overtreated, especially those with early OA.

References:

- [1] Luyten FP, Bierma-Zeinstra S, Dell'Accio F, Kraus VB, Nakata K, Sekiya I, Arden NK, Lohmander LS: Toward classification criteria for early osteoarthritis of the knee. *Semin Arthritis Rheum* 2018, 47(4):457-463.
- [2] Bellamy N, Wilson C, Hendrikz J: Population-based normative values for the Western Ontario and McMaster (WOMAC) Osteoarthritis Index: part I. *Semin Arthritis Rheum* 2011, 41(2):139-148.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.2277

FRI0423 CLINICAL BURDEN OF TREATING COMMERCIALY-INSURED OSTEOARTHRITIS PATIENTS WITH PRESCRIPTION NSAIDS

S. Silverman^{1,2}, J. Rice³, A. White³, N. Le³, M. Somma³, C. Beck⁴, R. Robinson⁵, P. Schepman⁴. ¹Cedars-Sinai Medical Center, Los Angeles, United States of America; ²University of California Los Angeles, David Geffen School of Medicine, Los Angeles, United States of America; ³Analysis Group, Boston, United States of America; ⁴Pfizer, New York, United States of America; ⁵Eli Lilly, Indianapolis, United States of America

Background: Prescription NSAIDs/Cox-2s ("NSAIDs") are commonly prescribed by physicians to treat patients with chronic pain, and much is known about the potential negative outcomes associated with their use¹. Such negative outcomes include gastrointestinal ("GI") issues and hepatorenal toxicity.¹ In addition, CV risk of Cox-2s has not been completely clarified.^{1,2} However, less is known about the extent to which these outcomes are pervasive and problematic in specific patient populations such as those diagnosed with osteoarthritis ("OA").

Objectives: The goal of this research is to assess the clinical burden of commercially-insured patients diagnosed with OA of the hip and/or knee before and after treatment with prescription NSAIDs, in a large, national database in recent years.

Methods: The Optum Healthcare Solutions, Inc. data (1/2012-3/2017) were used to identify patients ≥18 years old with ≥2 diagnoses of hip and/or knee OA, and ≥90 days supply of NSAIDs during the three-year period from first prescription (index date) after their first OA diagnosis. Patients were required to be continuously-enrolled during the six months before (baseline period) and 36 months after (follow-up period) the index date. Selected clinical outcomes such as GI issues, CV events, and renal toxicity were compared between the baseline and follow-up periods. Costs and resource use were normalized to account for differential duration in analytic time periods.

Results: Data for 22,435 patients (60.8% as female, with an average age of 62) with hip and/or knee OA were analyzed. On average, patients were prescribed NSAIDs for 489 days during the follow-up period. From the baseline period to follow-up period, negative clinical outcomes associated with GI issues increased by 393% (1.5% v 7.5%), driven by a 667% (0.3% v 2.3%) increase in acute GI hemorrhages. Additionally, negative clinical outcomes

associated with CV events increased by 73% (40.7% v 70.6%), largely due to a 600% (0.3% v 2.1%) increase in acute myocardial infarction. Lastly, negative clinical outcomes associated with renal toxicity increased by 433% (1.5% v 8.0%), with a 740% (0.5% v 4.2%) increase in acute renal failure being the most substantial.

Conclusion: These findings suggest that prescribing of NSAIDs among OA patients is associated with an increase in negative clinical outcomes. This suggests that new treatment options other than NSAIDs should be evaluated.

References:

- [1] van Laar M, et al. Pain treatment in arthritis-related pain: beyond NSAIDs. *Open Rheumatol J.* 2012;6:320–330.
- [2] Nissen SE, et al. Cardiovascular safety of celecoxib, naproxen, or ibuprofen for arthritis. *NEJM* 2016;2519-2529.

Disclosure of Interests: Stuart Silverman Consultant of: Pfizer and Eli Lilly for this project., Speakers bureau: Amgen, Radius, James Rice Consultant of: Pfizer and Eli Lilly have funded this project., Alan White Consultant of: Pfizer and Eli Lilly have funded this project., Nguyen Le Consultant of: Pfizer and Eli Lilly have funded this project., Michael Somma Consultant of: Eli Lilly and Pfizer have funded this project., Craig Beck Shareholder of: Pfizer, Employee of: Pfizer, Rebecca Robinson Shareholder of: Eli Lilly, Employee of: Eli Lilly, Patricia Schepman Shareholder of: Pfizer, Employee of: Pfizer

DOI: 10.1136/annrheumdis-2020-eular.3716

FRI0424

PROGRESSION OF PAIN, STIFFNESS, FUNCTION CHANGES AND ULTRASOUND DETECTED CHANGES IN THE GROUP OF 151 PATIENTS WITH HAND OSTEOARTHRITIS OVER THREE YEARS

O. Sleglova¹, O. Růžicková¹, K. Pavelka¹, L. Šenolt². ¹Institute of Rheumatology Prague, Department of Rheumatology, 1st Medical Faculty, Charles University Prague, Prague, Czech Republic; ²Institute of Rheumatology, Department of Rheumatology, 1st Medical Faculty, Charles University Prague, Prague, Czech Republic

Background: Hand osteoarthritis (HOA) is a common and frequent cause of pain. HOA is a heterogeneous group of disorders with two main subsets including non-erosive and erosive disease. Few studies demonstrated inflammatory ultrasound changes and more severe clinical symptoms in patients with erosive compared with non-erosive disease, however the results are inconsistent.

Objectives: The aim of this study was to evaluate progression of pain, stiffness, physical impairment and ultrasound features in patients with erosive and non-erosive HOA in a three years longitudinal study.

Methods: Consecutive patients with symptomatic HOA fulfilling the American College of Rheumatology (ACR) criteria were included in this study. Joint pain and swelling were assessed. Patients reported joint pain on 100mm visual analogue scale (VAS). Pain, joint stiffness and disability were assessed by the Australian/Canadian OA hand index (AUSCAN). Erosive disease was defined by at least one erosive interphalangeal joint. Synovial hypertrophy and power Doppler signal (PDS) were scored with ultrasound. Synovitis was graded on a scale of 0–3 and osteophytes were defined as cortical protrusions seen in two planes. Patients were examined at baseline and at the first, second and third year of follow-up.

Results: Altogether, 151 patients (16 male) with symptomatic nodal HOA were included in this study and followed between April 2012 and January 2020. Out of these patients, 84 (4 male) had erosive disease. The disease duration ($p<0.05$) was higher in patients with erosive compared with non-erosive disease. Pain reported on VAS was significantly higher ($p<0.01$) in patients with erosive compared with non-erosive disease at baseline. Progression of pain after the third year of follow up was significantly higher in patients with erosive disease ($p<0.01$). The number of painful and clinically swollen joints ($p<0.05$) was significantly higher in patients with erosive compared with non-erosive disease at baseline. It fluctuated over the second and third year of follow up, but it still remained statistically higher ($p<0.01$) at the third year of follow up in patients with erosive disease.

According to the AUSCAN, patients with erosive compared with non-erosive disease had more pain ($p<0.01$) and stiffness ($p<0.01$) at baseline. Pain ($p<0.05$), stiffness and also function ($p<0.05$) worsened in patients with erosive compared with non-erosive disease at the third year of follow up.

US-detected pathologies such as gray-scale synovitis ($p<0.001$), intensity of PDS ($p<0.01$) and number of osteophytes ($p<0.01$) were significantly higher in patients with erosive compared with non-erosive disease at baseline. There were improvements in gray-scale synovitis total score and intensity of PDS in patients with non-erosive disease while patients with erosive disease worsened after the second and third year of follow up. US-detected gray-scale synovitis ($p<0.001$), intensity of PDS ($p<0.01$) remained significantly higher in patients with erosive compared with non-erosive disease after the third year

of follow up. On the other hand, the progression of US-determined osteophyte formation was observed in both groups but was significantly higher ($p<0.05$) in patients with erosive compared with non-erosive disease after the third year of follow up.

Conclusion: The findings of this study show that pain and number of painful and clinically swollen joints associated with US-detected synovial changes and osteophyte formation is more severe in patients with erosive HOA than in patients with non-erosive disease. In addition, osteophyte formation is more likely to progress independent of synovial inflammation.

References:

- [1] Meersseman P, Van de Vyver C, Verbruggen G, et al. Clinical and radiological factors associated with erosive radiographic progression in hand osteoarthritis. *Osteoarthritis and Cartilage* 2015;23:2129-2133.

Acknowledgments: This work was supported by the project MHCR 023728 and AZV No. 18-00542.

Disclosure of Interests: Olga Sleglova: None declared, Olga Růžicková: None declared, Karel Pavelka Consultant of: Abbvie, MSD, BMS, Egis, Roche, UCB, Medac, Pfizer, Biogen, Speakers bureau: Abbvie, MSD, BMS, Egis, Roche, UCB, Medac, Pfizer, Biogen, Ladislav Šenolt: None declared

DOI: 10.1136/annrheumdis-2020-eular.2055

FRI0425

EVALUATION OF THE DOYLE INDEX AS A MEASURE OF PAIN SENSITIZATION IN PERSONS WITH HAND OSTEOARTHRITIS: EXPLORATORY ANALYSES FROM THE NOR-HAND STUDY

P. Steen Pettersen^{1,2}, T. Neogi³, K. Magnusson¹, B. Slatkowsky-Christensen¹, H. B. Hammer^{1,2}, T. Uhlig^{1,2}, T. K. Kvien^{1,2}, I. K. Haugen¹. ¹Diakonhjemmet Hospital, Rheumatology, Oslo, Norway; ²University of Oslo, Faculty of Medicine, Oslo, Norway; ³Boston University School of Medicine, Rheumatology, Boston, United States of America

Background: Pressure pain threshold (PPT) is a measure of pain sensitization; altered pain mechanisms in the peripheral and/or central nervous system causing increased pain sensitivity. PPT testing may be a useful tool to classify pain phenotypes but requires special equipment not available in the clinic. The Doyle index (DI) is a clinical measure of joint tenderness upon palpation. It is considered as an outcome measure of pain and disease activity in hand OA and is a potential alternative to PPT. It is unclear if joint tenderness is related to pain sensitization, as joint tenderness could reflect pure nociceptive pain without sensitization.

Objectives: Using data from the Nor-Hand study we will explore how DI performs as a measure of pain sensitization in hand OA by examining associations and agreements between DI and PPT at joint level, and correlations between PPT values and DI sum score at person level.

Methods: PPT was tested with a hand-held algometer (FPIIX25, 1cm² flat rubber tip) at the dorsal side of the most painful DIP/PIP and a non-painful DIP/PIP joint (local PPTs) and left radioulnar joint and mid-portions of the trapezius and tibialis anterior muscle (remote PPTs). Low local PPTs indicate peripheral and/or central sensitization, while low remote PPTs indicate central sensitization. According to DI, tenderness in the bilateral thumb base and finger joints were graded by a rheumatologist by pressing on the lateral joint margins: 0=no pain, 1=patient complains of pain, 2=patient complains of pain and winces, 3=patient complains of pain, winces and withdraws joint. We examined whether increasing DI was associated with local PPT using mixed models. To assess agreement between DI and PPT, we categorized PPT of the painful finger joints into a semi-quantitative scale with the same number of categories (n=4) as DI. We identified the cut-offs for the PPT categories that maximized the agreement (weighted kappa) with DI. Finally, we examined Spearman's correlations between DI sum score [range 0-90] and PPTs of local and remote sites.

Results: The majority of the 285 eligible participants were women (88%) and mean (SD) age was 61 (6) years. Joints with high DI had lower PPT values (Figure 1). We found a linear association of lower PPT with increasing DI for all joints combined (beta -0.7, 95% CI -0.8, -0.6). Similar results were found for the painful joints (beta -0.8, 95% CI -1.0, -0.6), but weaker for non-painful joints (beta -0.5, 95% CI -1.0, 0.0) where few joints had DI grade 2-3 (Figure 1). The analyses on maximized agreement between DI and the PPT categories gave a weighted kappa equal to 0.32 (Table).

Median (IQR) DI sum score was 9 (5, 15). We found weak inverse correlations between DI sum score and PPT at local (painful finger: ρ -0.24 (95% CI -0.32, -0.16), non-painful finger: ρ -0.22 (95% CI -0.29, -0.11) and remote sites (radioulnar joint: ρ -0.17 (95% CI -0.29, -0.06), trapezius: ρ -0.25 (95% CI -0.36, -0.14), tibialis anterior: ρ -0.20 (95% CI -0.31, -0.09)).

Conclusion: The DI was associated with lower PPT at painful finger joints. Large variance of PPT within each DI grade resulted in fair agreement. DI of non-painful