Graduate School of Arts and Sciences, Meguro City, Japan; ²University of Leeds, Musculoskeletal Medicine, Leeds, United Kingdom; ³Pfizer, Inc., HEOR, Shibuya City, Japan; ⁴Pfizer Ltd, HEOR, Surrey, United Kingdom; ⁵Adelphi Real World, Real World Research, Bollington, United Kingdom

Background: Patients with knee osteoarthritis (OA) who do not achieve adequate pain relief and functional improvement with a combination of non-pharmacologic and pharmacologic therapies are recommended an arthroplasty as an effective option to relieve severe pain and functional limitations. However, some patients are reluctant to undergo surgical interventions, and clinicians may choose to avoid or delay surgery due to safety risks and/or the financial cost. It is of interest to understand if the use and perception of surgery differs between countries, however, few published data exist.

Objectives: To demonstrate how surgery and the use of surgical procedures differs across Japan, United States of America (US) and 5 major European countries (EU5) and to evaluate patient perception towards surgery.

Methods: Data were drawn from the Adelphi OA Disease Specific Programme (2017-18), a point-in-time survey of primary care physicians (PCP), rheumatologists (rheums), orthopaedic surgeons (orthos) and their OA patients. Patients with physician-diagnosed knee OA were included and segmented into two categories: had previous surgery (PS) and never had surgery (NS). A Fisher's exact test was performed on the two groups. Physicians reported on patient demographics; whether patients had undergone surgery; type of surgery; success of surgery; how success was defined; and reasons for wanting to delay surgery. Patients reported their willingness to undergo surgery; reasons for not wanting surgery; how successful their surgery was; and how they defined this success.

Results: Physician/patient reported data were available for 302,230 (Japan), 527,283 (US) and 1487,726 (EU5) patients with diagnosed knee OA. Patients were categorised by their physicians as mild (40% Japan; 34% US; 24% EU5), moderate (49% Japan; 49% US; 56% EU5) or severe (9% Japan; 17% US; 19% EU5). Patients in Japan were more likely to be female (78% vs 54% US; 58% EU5), older (73 vs 65 US; 66 EU5) and have a lower BMI than patients in the US and EU5. Obesity and diabetes were much less prevalent among patients in Japan. One in ten patients in Japan had undergone a surgery (10%), far fewer than in the US (22%) or EU5 (17%). When surgery was performed, this was more likely to be a total joint replacement (TJR) in Japan, whereas in the EU and US, arthroscopic washout was more commonly performed.

For over half of Japanese patients (56%), successful surgery was more likely to be defined as having no more pain (vs. 35% US; 14% EU5). Improved mobility and a reduction in pain were also commonly reported reasons. Physicians (in each region) were more likely to suggest pain reduction, rather than no pain, and improved mobility as markers of success. Patients in Japan were much more likely to say they would not agree to surgery if recommended by their doctor, or were unsure (84% vs. 68% US; 62% EU5). The main reason for patient reluctance in Japan was fear of surgery, whereas in the US and EU5 the main reason given was that surgery was not needed. This finding was also evident among physicians in Japan, who frequently reported that patient reluctance was a key reason for delaying surgery. Physicians in Japan, do however, report that patient request was one of their main triggers for recommending surgery (45% vs 20% US; 16% EU5).

Conclusion: Although surgery can be an effective option for those with OA who have exhausted other treatment options, some patients are reluctant to undergo surgery out of fear, especially in Japan, possibly due to the higher patient age. Physicians aiming to delay surgery were driven by patient reluctance in Japan, whereas cost to patient was a bigger factor in the US and EU5. The higher level of TJR vs. other surgery options among patients in Japan may suggest physicians are looking for higher levels of efficacy.

Disclosure of Interests: Naoshi Fukui Speakers bureau: Pfizer, Consultant of: Pfizer, Philip G Conaghan Speakers bureau: Abbvie, Novartis, Consultant of: AstraZeneca, BMS, Eli Lilly, EMD Serono, Flexion Therapeutics, Galapagos, Gilead, Novartis, Pfizer, Kanae Togo Shareholder of: Pfizer, Employee of: Pfizer, Nozomi Ebata Shareholder of: Pfizer, Employee of: Pfizer, Lucy Abraham Shareholder of: Pfizer, Employee of: Pfizer, James Jackson: None declared, Jessica Jackson: None declared, Mia Berry: None declared, Hemant Pandit Paid instructor for: Bristol Myers Squibb, Consultant of: Johnson and Johnson, Grant/research support from: GSK

DOI: 10.1136/annrheumdis-2021-eular.2510

POS0129

ASSOCIATION BETWEEN OSTEOARTHRITIS-RELATED SERUM BIOCHEMICAL MARKERS OVER 11 YEARS AND KNEE MRI-BASED IMAGING BIOMARKERS IN MIDDLE-AGED ADULTS

B. Antony¹, A. Singh¹, L. Blizzard¹, A. Venn¹, G. Jones¹, J. Burgess¹, V. Parameswaran², F. Cicuttini³, L. March⁴, C. Ding¹. ¹University of Tasmania, Menzies Institute for Medical Research, Hobart, Australia; ²Royal Hobart Hospital, Department of Endocrinology, Hobart, Australia; ³Monash University,

Department of Epidemiology and Preventive Medicine, Melbourne, Australia;

⁴University of Sydney, Institute of Bone and Joint Research, Kolling Institute of Medical Research, Sydney, Australia

Background: Serum levels of osteoarthritis (OA)-related cartilage and joint-specific biochemical markers – cartilage oligomeric matrix protein (COMP), matrix metalloproteinase (MMP)-3, and hyaluronan (HA) – are shown to be associated with cartilage degradation, joint tissue degradation, and synovitis in patients with OA. Although these OA-related biochemical markers may initially precede the MRI biomarkers of joint structural changes, such changes detected in MRI can lead to biochemical marker changes later as the condition progresses. However, there is a lack of data on OA-related biochemical markers' association with MRI-based biomarkers in the middle-aged general population.

Objectives: We aimed to describe the associations between OA-related biochemical markers and MRI-based imaging biomarkers in middle-aged adults followed up over 10-13 years.

Methods: Blood samples were collected during the Childhood Determinants of Adult Health (CDAH)-1 study at baseline (year: 2004-06, age: 26–36 years) and 10-13 year follow-up (CDAH-3; year: 2014–2019, age: 36–49 years). Serum samples from baseline (n=156) and follow-up (n= 167) were analyzed for three OA-related biomarkers – namely COMP, MMP-3, and HA– using non isotopic ELISA assay methodology. Knee MRI scans were obtained during the CDAH-knee study (year: 2008-10, age: 30-40 years, n=313), and MRIs were assessed for cartilage volume, cartilage thickness, subchondral bone area, cartilage defects, and bone marrow lesions (BML). Univariable and multivariable (adjusted for age, sex, and body mass index (BMI)) linear regression and logistic regression were used to describe the association of biochemical marker at CDAH-1 and MRI-based imaging biomarkers at CDAH-knee, and Tobit regression was used to describe the association of MRI-based imaging biomarkers at CDAH-knee and biochemical markers at CDAH-3.

Results: In the multivariable model for the association of biochemical marker with MRI-based imaging biomarkers (assessed after 4 years), we found a significant negative association of COMP with medial femorotibial compartment cartilage thickness (-0.010 (-0.019, -0.000) p=0.045), and MMP-3 with patellar cartilage thickness (-9.075 (-16.344, -1.807) p=0.015) and total bone area (-0.047 (-0.086, -0.007) p=0.020). No significant association was observed between HA and MRI markers.

In the multivariable model for association of MRI-based imaging biomarkers with biochemical markers (assessed after 6-9 years), a significant negative association of total cartilage volume (-0.0005 (-0.0008, -0.0002) p=0.001) and total cartilage thickness (-0.628 (-1.143, -0.114) p=0.017) with MMP-3, and total bone area with COMP (0.270 (-0.474, -0.006) p=0.010) was observed. No significant association was observed between MRI-based imaging biomarkers and HA.

Conclusion: COMP and MMP-3 levels were negatively associated with knee cartilage thickness assessed 4-years later. Similarly, knee cartilage thickness and volume were negatively associated with COMP and MMP-3 levels assessed 6-9 years later in population-based middle-aged adults, indicating an interdependent negative association of OA-related biochemical markers and MRI-based imaging biomarkers. These results suggest that OA-related biochemical markers may predict future MRI-based imaging biomarkers in middle-aged adults and thus represent possible at-risk populations to target for structure modification interventions.

Acknowledgements: This project was funded by the National Health and Medical Research Council of Australia Project Grant and Royal Hobart Hospital Research Foundation Project Grant.

Disclosure of Interests: Benny Antony Grant/research support from: Investigator-Initiated Clinical Trial support from Nat Rem Ltd., Ambrish Singh: None declared, Leigh Blizzard: None declared, Alison Venn: None declared, Graeme Jones Speakers bureau: Speaker for various pharma, Grant/research support from: Investigator-Initiated Clinical Trial support, John Burgess: None declared, Venkat Parameswaran: None declared, Flavia Cicuttini: None declared, Lyn March: None declared, Changhai Ding: None declared

DOI: 10.1136/annrheumdis-2021-eular.3418

POS0130

ASSOCIATION BETWEEN HYPERTENSION AND OSTEOARTHRITIS

E. Taskina¹, E. Strebkova¹, L. Alekseeva^{1,2}, N. Kashevarova¹, K. Telyshev¹, S. Anikin¹, E. Sharapova¹, D. Kudinsky¹, A. Lila^{2,3}. ¹V.A. Nasonova Research Institute of Rheumatology, Osteoarthritis, Moscow, Russian Federation; ²Russian Medical Academy of Continuous Professional Education, Rheumatology, Moscow, Russian Federation; ³V.A. Nasonova Research Institute of Rheumatology, Director, Moscow, Russian Federation

Background:

Objectives: To evaluate the relationship between arterial hypertension (AH) and the course of knee osteoarthritis (OA).

Methods: The prospective study included 109 women aged 38-75 y.o., of I-III Kellgren J. - Lawrence J. stage of knee OA (ACR), who signed an informed consent. The average age was 59.3 ± 8.7 y.o. (from 38 to 74), the average duration of the OA was 7 (4-12) years. The average values of the body mass index (BMI) corresponded to obesity (30.9 ± 5.4 kg / m²), waist circumference (WC) – 94.4 ± 11.7 cm. An individual card was filled in for each patient, including anthropometric parameters, anamnesis and clinical examination data, assessment of knee joint pain according to VAS, WOMAC, KOOS and DN4 indices, and concomitant diseases. All patients underwent standard X-ray of the knee joints, laboratory examination.

Results: AH was diagnosed in 69.7 % patients with OA. Patients were divided into 2 groups, according to the presence or absence of AH (Table 1). Patients with AH were older, had a higher BMI, WC, a longer duration of menopause and significantly earlier its onset ($p < 0.05$). Patients with OA and AH had a more severe course of OA: higher values of pain in VAS, total WOMAC and all its components, DN4, worse indicators of total KOOS ($p < 0.05$). X-ray examination showed a tendency to a more significant narrowing of the medial space of the knee joints ($p = 0.07$). Laboratory examination showed higher values of CRP, ESR, IL-6, and leptin ($p < 0.05$).

Table 1. Comparative characteristics of OA patients with and without AH

Parameters	Patients with AH (n=76)	Patients without AH (n=33)	p
Age, y.o.	61 (57-68)	55.5 (49-58)	<0.01
WC, cm	92 (90-105)	86.5 (84-90)	<0.01
Age of menopause, y.o.	50 (47-52)	55.5 (49-58)	0.02
Duration of menopause, years	14 (7.5-19)	7 (4-8)	<0.01
Duration of OA, years	10 (5-15)	4 (1-6)	0.001
VAS pain score, mm	49 (40-57)	42 (24-50)	0.02
WOMAC pain, mm	189.5 (140-250)	140 (108-162)	0.001
WOMAC stiffness, mm	77.5 (42-100)	56 (33.5-71.5)	0.01
WOMAC functional impairment (FI), mm	651 (547-902)	546.5 (320-663.5)	0.002
Total WOMAC, mm	899 (728-1280)	734 (526.5-882)	0.001
KOOS, points	0.47 (0.36-0.57)	0.6 (0.53-0.75)	<0.01
DN4, points	2 (1-3)	1 (0-2)	0.01
Overall health status, mm	45 (35-55)	36.5 (28.5-48.5)	0.02
The size of the medial space of joint according to X-ray, mm	2.45 (1.35-4.35)	3.6 (2.8-4.3)	0.07
CRP, mg/l	2.38 (1.47-4.85)	1.21 (0.69-2.53)	<0.01
Leptin, ng/ml	37.4 (26.5-53.3)	23.6 (15.1-40.2)	0.01
IL-6, pg/ml	0.7 (0.4-1.2)	0.45 (0.3-0.7)	0.03
ESR, mm/h	14 (7-18)	7 (6-12)	0.02

We founded positive ($p < 0.05$) associations between AH and a more severe, prolonged course of OA ($r = -0.39$, $p < 0.01$) in the the Spearman rank-order correlation coefficient analysis. Thus, patients with AH had higher values of VAS pain ($r = 0.31$, $p < 0.01$), total WOMAC ($r = 0.31$, $p < 0.01$) and all its components (pain ($r = 0.33$, $p < 0.01$), FI ($r = 0.3$, $p < 0.01$) and stiffness ($r = 0.24$, $p < 0.01$), DN4 ($r = 0.24$, $p = 0.01$), worse indicators of total KOOS ($r = -0.42$, $p < 0.01$) and overall health status ($r = 0.23$, $p = 0.02$), more often detected more advanced stage of OA ($r = 0.24$, $p = 0.03$) and synovitis ($r = 0.23$, $p = 0.01$). In addition, positive relationships were found with CRP ($r = 0.31$, $p < 0.01$), IL - 6 ($r = 0.3$, $p = 0.03$), ESR ($r = 0.3$, $p = 0.02$). Positive relationships were confirmed between AH and age ($r = 0.39$, $p < 0.01$), menopause duration ($r = 0.39$, $p < 0.01$), WC ($r = 0.37$, $p < 0.01$), leptin ($r = 0.35$, $p = 0.01$), the presence of hypertriglyceridemia ($r = 0.35$, $p = 0.01$) and cardiovascular risks according to SCORE ($r = 0.26$, $p = 0.02$), considering traditional risk factors for cardiovascular diseases (CVD).

Conclusion: Thus, we found that AH in patients with knee OA is affected by a variety of variables, both related to traditional CVD factors and to OA itself, and the correlations found are approximately equal in strength. The results obtained require further study, and it is possible that preventive measures aimed at reducing the traditional risk factors of diseases of the circulatory system, or correcting existing CVD, will contribute to a more favorable course of OA.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2021-eular.3859

POS0131 10-YEAR PROBABILITY OF A MAJOR OSTEOPOROTIC FRACTURES IN WOMEN WITH OSTEOARTHRITIS OF THE KNEE JOINT

E. Usova¹, O. Malyshenko¹, M. Leteva¹, J. Averkieva¹, M. Koroleva¹, T. Raskina¹. ¹State Educational Institution of Higher Education "Kemerovo State Medical University", Kemerovo, Russian Federation, Department of Internal Diseases, Kemerovo, Russian Federation

Background: The relationship between osteoporosis and osteoarthritis (OA) is complex and contradictory. Some studies suggest a protective effect of OA

in osteoporosis [1-2]. However, other studies show that increased bone mineral density (BMD) in OA not only does not reduce the risk of fractures, but can also increase it [3-4].

Objectives: To assess the 10-year probability of osteoporotic fractures using the FRAX calculator in women with OA of the knee joint.

Methods: The study included 22 women (average age 63.7 ± 1.01 years) diagnosed with ACP of the knee joint according to the ACR criteria (1991). The Control Group included 24 conditionally healthy women without OA knee joint, with an average age of 63.6 ± 1.37 years.

The BMD (g/cm²) and the T-criterion (standard deviation, SD) of the neck of the femur and lumbar spine (LI-LIV) were evaluated by the method of two-power X-ray absorption (DXA) (apparatus «Lunar Prodigy Primo», USA). 10-year probability of major osteoporotic fractures (clinically significant fracture of the spine, distal fracture of the forearm, fracture of the proximal femur, or fracture of the shoulder) and fracture of the proximal thigh with the FRAX calculator (version 3.5 for Russian population).

Results: An osteopenic syndrome in the cohort under investigation was found in 42 (91.3%) patients, of whom osteopenia in 24 (52.2%) women and osteoporosis in 18 (39.1%). A normal BMD is registered in 4 (8.7%) patients.

In the group of patients with knee joint OA, only 2 (9.1%) of women had a normal BMD, 11 (50.0%) of osteoporosis, and 9 (40.9%). Osteopenic syndrome is generally found in 20 (90.9%) patients.

In the control group, osteopenic syndrome has been diagnosed in 22 (91.7%) of whom: osteopenia in 13 (54.2%), osteoporosis in 9 (37.5%) patients. Two (8.3%) women had a normal BMD. There were no statistically significant differences in the structure of the osteopenic syndrome among the studied groups ($p = 0.961$).

An analysis of the 10-year probability of major osteoporotic fractures found that women with OA knee joint had the above probability of 12.3 ± 0.91 , and in the control group 14.2 ± 1.06 ($p = 0.085$).

The 10-year probability of fracture of the proximal femur in women with OA was statistically less significant than in the control group: 1.55 ($0.70; 1.98$) and 2.10 ($1.20; 2.95$), ($p = 0.031$), respectively.

Conclusion: The total incidence of the osteopenic syndrome in the cohort under investigation was 91.3% (90.9% in women with OA, 91.7% in the control group). The frequency of registration of osteopenia and osteoporosis in women with OA did not differ statistically significantly from the control group. The probability of major osteoporotic fractures within 10 years was comparable in these groups. The probability of a proximal femur fracture in women with OA was statistically significant, but not clinically significant, compared to the control group.

REFERENCES:

- [1] Yamamoto Y, Turkiewicz A, Wingstrand H, et al. Fragility Fractures in Patients with Rheumatoid Arthritis and Osteoarthritis Compared with the General Population. *J Rheumatol*. 2015 Nov;42(11):2055-8.
- [2] Vala CH, Kärrholm J, Kanis JA, et al. Risk for hip fracture before and after total knee replacement in Sweden. *Osteoporos Int*. 2020 May;31(5):887-895.
- [3] Kim BY, Kim HA, Jung JY, et al. Clinical Impact of the Fracture Risk Assessment Tool on the Treatment Decision for Osteoporosis in Patients with Knee Osteoarthritis: A Multicenter Comparative Study of the Fracture Risk Assessment Tool and World Health Organization Criteria. *J Clin Med*. 2019 Jun 26;8(7):918.
- [4] Soh SE, Barker AL, Morello RT, et al. Applying the International Classification of Functioning, Disability and Health framework to determine the predictors of falls and fractures in people with osteoarthritis or at high risk of developing osteoarthritis: data from the Osteoarthritis Initiative. *BMC Musculoskelet Disord*. 2020 Feb 29;21(1):138.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2021-eular.3446

Crystal arthritis

POS0132 IS THE INTERCRITICAL GOUT REALLY ASYMPTOMATIC? THE INFLAMMATORY ROLE OF THE SILENT URATE CRYSTAL DEPOSITION

C. Diaz-Torne¹, M. A. Ortiz², S. Jeria Navarro¹, A. Garcia-Gullien¹, L. Sainz¹, H. Corominas¹, S. Vidal². ¹Hospital de la Santa Creu i Sant Pau, Rheumatology, Barcelona, Spain; ²Institut de Recerca Hospital de la Santa Creu i Sant Pau, Immunology, Barcelona, Spain

Background: Gout is the most prevalent inflammatory arthritis. Gout is chronic inflammatory deposition disease related to an increase of cardiovascular (CV) events and mortality. Subclinical chronic inflammation has been demonstrated in this patients but not its relation with the monosodium urate (MSU) crystal deposit size and the number of CV risk factors.