FRI0549

OSTEOARTHRITIS (OA) AND RHEUMATOID ARTHRITIS (RA) PATIENTS HAVE SIMILAR DISEASE BURDENS AT FIRST VISIT TO AN ACADEMIC RHEUMATOLOGY SETTING, BUT OA PATIENTS HAVE A HIGHER BURDEN AT A 6-MONTH FOLLOW-UP VISIT

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Background: Osteoarthritis (OA) commonly is regarded as less severe than rheumatoid arthritis (RA). However, limited data are available for direct comparisons, largely because different measures traditionally are used in RA – primarily a HAQ (Health Assessment Questionnaire) vs OA – a WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index). RAPID3 (Routine Assessment of Patient Index Data) on an MDHAQ (Multi-Dimensional HAQ) is a self-report index that is informative in RA and most rheumatic diseases, including OA.¹ A recent analysis of unselected patients from 4 rheumatology settings indicated that RAPID3 and other MDHAQ scores were similar or higher in OA versus RA patients,² but those findings were from a cross-sectional convenience sample of unselected patients likely affected by treatment, rather than from an initial visit prior to rheumatologic therapy.

Objectives: To analyse MDHAQ/RAPID3 scores in patients with a primary diagnosis of either OA or RA at their initial visit and at 6 month follow-up at an academic rheumatology centre.

Methods: At one site, all patients complete an MDHAQ/RAPID3 prior to seeing the rheumatologist. The 2-page MDHAQ/RAPID3 includes 0–10 scores for physical function (FN) (converted from 0–3) and visual analogue scale (VAS) scores for pain (PN) and patient global assessment (PATGL), compiled into a 0–30 RAPID3. New patients seen between 2013 and 2017 with physician-diagnosed primary OA or RA and complete RAPID3 data were studied. Mean FN, PN, PATGL and RAPID3 scores in RA and OA at baseline and 6 month follow-up (range 3–9 months) were compared for differences between first and second visits using t-tests, and between OA and RA using MANOVA.

Results: At first visit, mean RAPID3 was 15.9 in OA vs 15.3 in RA (table 1). At a mean of a 5 month (actual) follow-up visit, RAPID3 fell from 15.9 to 14.9 (–1.0, $p=0.06$) in OA vs 15.3 to 11.1 (–4.2, $p<0.001$) in RA, resulting in significantly higher scores in OA vs RA (table 1). These differences remained significant adjusted for age, sex, body mass index, and education level.

Mean and standard deviation (SD) at first visit and 5 month follow up visit MDHAQ/RAPID3 of patients with OA and RA seen in routine care

Measures	OA (n=109)	RA (n=102)	OA vs RA p value	OA vs RA p adjusted*
Initial visit				
Function (0–10)	3.15 (1.9)	2.89 (2.2)	0.34	0.60
Pain (0–10)	7.01 (2.3)	6.36 (2.9)	0.07	0.49
PATGL (0–10)	5.69 (2.8)	5.85 (3.0)	0.69	0.30
RAPID3 (0–30)	15.9 (5.9)	15.3 (7.0)	0.52	0.47
5 months follow-up visit				
Function(0–10)	2.93 (1.9)	2.24 (2.2)	0.02	0.006
Pain (0–10)	6.36 (2.5)	4.60 (3.0)	<0.001	0.03
PATGL (0–10)	5.62 (2.7)	4.10 (3.2)	<0.001	0.001
RAPID3 (0–30)	14.9 (6)	11.1 (7.6)	<0.001	0.001

*adjusted for age, sex, BMI and education

Conclusions: Patients with OA or RA have similar disease burdens at first visit to a rheumatology site, but OA patients have a considerably higher burden 5 months later, reflecting more effective treatments for RA than for OA. Nonetheless, OA is a severe disease at first visit, suggesting a need for further research in OA toward improved treatment and outcomes. MDHAQ/RAPID3 is feasible and useful to assess and monitor clinical status in routine care of patients with different rheumatic diseases.

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FRI0550

DIFFERENTIAL IMPACT OF OBESITY, STRUCTURAL SEVERITY AND THEIR COMBINATION ON THE EFFICACY OF VISCOSUPPLEMENTATION IN PATIENTS WITH KNEE OSTEOARTHRITIS. POST-HOC ANALYSIS OF A DOUBLE-BLIND, CONTROLLED, MULTICENTER, RANDOMISED TRIAL

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Background: It has been demonstrated that radiological severity and obesity were independent factors of VS failure and that the percentage of patients fulfilling the OMERACT-OARS response criteria was only 41.7% in patients with both marked joint space narrowing and obesity while it was 87.1% in those who did not have any of these two risk factors.¹

Objectives: The aim of the study was to assess the impact of obesity, radiographic severity and their combination on pain and function scores, 6 months after viscosupplementation in patients with knee osteoarthritis.

Methods: Post-hoc analysis of a prospective, double-blind, randomised, multi-centre, parallel-group trial, aimed to compare 2 viscosupplements (x 3 weekly intra articular injections of HANOX-M or Bio-HA) in patients with symptomatic knee OA. Patients were classified according to body mass index (BMI<or>30 kg.²) and to OARS radiological grade (1–2 versus 3). Responses in terms of WOMAC pain and function scores (differences between baseline and 6 months, as well as their variation over time) were compared according to BMI, radiological grade and to the combination of the 2 parameters.

Results: One-hundred and sixty-six patients from the intent-to-treat population, were analysed: Forty-seven patients (28.3%) were classified as obese (BMI ≥30 kg.²). At baseline WOMAC pain score was similar in obese and non-obese patients, whereas WOMAC function score was statistically higher in obese versus non-obese subjects. At month 6, WOMAC pain and function scores decreased significantly by 43.4% and 41.9% ($p<0.0001$). At month 6, WOMAC pain was significantly lower in non-obese than in obese patients (4.9±4.1 versus 7.1±4.9; $p=0.008$) and in patients OARS grade 1–2 versus 3 (4.8±4.3 versus 6.4±4.5; $p=0.009$). WOMAC pain score, was 85.7% greater in obese/grade 3 patients than in non-obese/grade 1–2 subjects (7.8±5.1 versus 4.2±4.1, $p=0.001$). Lastly, the decrease of pain was twice greater in non-obese patients with OARS 1–2 than that of obese patients with OARS grade 3 (–5.7±4.3 versus –2.8±4.3, $p=0.007$). Similarly, WOMAC function score at month 6 was significantly higher in obese versus non-obese patients, in OARS 3 versus OARS 1–2 and in obese/grade 3 than in non-obese/grade 1–2.

Conclusions: This trial confirms that obesity and advanced stage are independent predictors of a lower response to viscosupplementation in knee OA. We identified a population sub-group (patients with both obesity and severe joint space narrowing) for who HA should not be recommended, regarding the weak benefit it provides.

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FRI0551

COMPARISON OF PHYSICAL ACTIVITY (PA) BETWEEN PATIENTS WITH DIFFERENT STAGES OF OSTEOARTHRITIS(OA) AND THE GENERAL POPULATION: A CROSS-SECTIONAL STUDY

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Background: The benefit of Physical Activity (PA) in different stages of osteoarthritis (OA) is unambiguous considering the positive effects on pain and physical functioning. However, insight in the characteristics of PA (i.e. duration and

intensity) between patients in different stages of OA is scarce. Also, comparisons with the general population are understudied.

Objectives: To compare the amount (i.e. duration and intensity) of PA in patients in different stages of OA (i.e. patients in primary and secondary care, and post Total Joint Arthroplasty (TJA)) and the general population.

Methods: This study is based on secondary analyses of baseline data from four studies:¹ an effectiveness study of an educational program for OA patients in primary care,² a study on effectiveness of a multidisciplinary self-management program for generalised OA in secondary care,³ a study among patients whom underwent TJA for end-stage OA in preceding 7–22 months, and⁴ a nationwide study among the general population in the Netherlands (n=14,000) on general health.¹ In the current study only patients aged ≥40 years were included. The SQUASH questionnaire was used to assess PA in all 4 studies and to calculate adherence to PA recommendations, duration (hrs/wk) and intensity (MET.hrs/wk). To compare the amount (hrs/wk) and intensity (MET.hrs/wk) between different stages of OA and the general population, we applied multiple linear regression analysis, adjusted for age, gender and Body Mass Index (BMI).

Results: Demographic characteristics and adherence to PA recommendations are illustrated in table 1. Mean duration and intensity of PA in the general population were 41.3 hrs/week and 145.7 MET.hrs/week, respectively. Patients after TJA showed higher PA levels (both in terms of duration and intensity) than patients in secondary care and the general population (table 2).

Abstract FRI0551 – Table 1. Demographic characteristics of three OA stages and the general population in the Netherlands

	Primary care n=117	Secondary care n=144	Post-TJA n=519	General population n=4448
Age (years (SD))	68.3 (10.5)	59.9 (7.6)	70.1 (9.0)	59.2 (11.5)
Gender,% Female	59.8	85.4	65.3	51.8
Adherence to Dutch PA recommendations(% yes)	72.6	72.9	76.7	68.8

Abstract FRI0551 – Table 2. Relative difference (%) in mean duration (hours/week) and intensity (MET.hrs/week) of PA between groups adjusted for age, gender and BMI.

MET.hrs/week hrs/week	General population	Primary care	Secondary care	Post TJA
General population		0.3	5.4	–5.0*
Primary care	1.2		5.1	–5.2
Secondary care	–2.5	–3.6		–9.9*
Post TJA	5.3*	4.1	8.0*	

*Indicates p-value≤0.05.

Conclusions: The results of this study show small non-significant differences in PA levels between primary care patients and the general population. Patients after TJA are more physically active than secondary care patients and the general population. However, low adherence rates to PA recommendations indicate the necessity to promote PA in a substantial group of OA patients.

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FRI0552 SM04690, A WNT PATHWAY INHIBITOR: ANTI-INFLAMMATORY AND CARTILAGE PROTECTIVE EFFECTS IN PRECLINICAL OA MODELS

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Background: Osteoarthritis (OA) is characterised by pain, swelling, and reduced function in the knee joint. Upregulated Wnt signalling drives OA through synovial inflammation, increased subchondral bone, and thinning cartilage.

Objectives: SM04690, a small molecule Wnt pathway inhibitor that demonstrated chondrogenic and anti-inflammatory properties preclinically¹, was further evaluated to determine its potential to reduce inflammation, protect cartilage, improve joint health and modify pain in OA.

Methods: Cytokine secretion (IL-6 and TNF-α) from IL-1β-stimulated and SM04690-treated synovial fibroblasts was measured by ELISA. A single intra-

articular injection of SM04690 or vehicle was evaluated in an *in vivo* rat knee monosodium iodoacetate (MIA) OA model. Joint inflammation was evaluated by H and E staining, inflammatory cytokines (IL-1α, IL-1β, IL-6, TNF-α and IFN-γ) by qPCR, and cartilage protection by qPCR for matrix metalloproteinases (MMPs). Histological evaluation of cartilage health was performed using OARSI score and thickness by Safranin-O staining. Pain was measured as paw withdrawal threshold using Von Frey apparatus and weight distribution using incapitance metre and analysed using generalised estimating equation regression.

Results: SM04690 dose-dependently inhibited IL-1β-induced cytokine secretion in synovial fibroblasts (EC₅₀ ~30 nM; figure 1). In the rat MIA OA model, compared to vehicle, SM04690 injection reduced visible knee swelling, inflammatory cells, and proinflammatory cytokine and MMP production (p<0.05). SM04690 increased (p<0.01) paw withdrawal threshold from day 6 and improved weight distribution to the affected limb in treated rats, at multiple timepoints, compared to vehicle (figure 2). SM04690 increased Safranin-O stained cartilage thickness and decreased OARSI score (p<0.05) compared to vehicle.

Abstract FRI0552 – Figure 1. SM04690 inhibited inflammatory cytokine production in synovial fibroblasts *in vitro*

Abstract FRI0552 – Figure 2. SM04690 inhibited inflammatory cytokine production and decreased inflammation and pain in the MIA model of OA

Conclusions: In a rat MIA OA model, SM04690 injection reduced inflammation, protease production, and pain, with improved cartilage and joint health, compared to vehicle. Previously demonstrated regenerative effects in nonclinical studies¹, along with anti-inflammatory properties, show SM04690 may improve symptoms and potentially provide disease modification in OA. Clinical studies are ongoing.

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FRI0553

THE ROLE OF AGE-RELATED SARCOPENIA IN OSTEOARTHRITIS OF LOWER EXTREMITY

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Background: Sarcopenia, defined as the age-related loss of muscle mass and low muscle function.¹ The prevalence of sarcopenia worldwide by meta-analysis of 35 articles was 10% (95% CI: 8%–12%) in men and 10% (95% CI: 8%–13%) in women, respectively.² A review of the literature on osteoarthritis (OA) and sarcopenia has shown that the age factor that contributes to the development of OA includes a decrease in muscle strength. In people with OD of the lower extremity, the frequency of falls was increased by a factor of 2–5.³ OA contributed to the development of sarcopenia in elderly women.⁴

Objectives: Perform body composition and muscle analysis in patients with osteoarthritis and identify risk factors for sarcopenia that affect patients with osteoarthritis.

Methods: Prospective study of 159 women, mean age 74±13.3. The walking speed, handgrip strength were evaluated to apply the European Working Group on Sarcopenia. Assessment of appendicular skeletal muscle mass (ALM/h²) and total body fat were assessed using DXA, on Hologic Explorer machines. Covariates were determined by questionnaires and interviews.

Results: 31.45% of people with OA older than 65 years had sarcopenia. Patients with OA had a decrease in muscle strength and function, regardless of sarcopenia. Statistically significantly more frequent in patients with OA were lower indexes of lean mass index (ALM/h²) and body mass index (BMI) (p<0.01). The incidence of sarcopenia increased with age (p<0.01). 61.5% of patients with sarcopenia significantly more often had high values of c-reactive protein – CRP (x²=31.18, p<0.0001). Patients with sarcopenia were statistically significantly more likely to have vitamin D deficiency than patients without sarcopenia (x²=8.11, p<0.01). Cases of falls were observed in 90% of patients with sarcopenia (x²=79.29, p<0.001). Low physical activity 86% of patients with sarcopenia are statistically significantly higher than in patients without sarcopenia (95% CI: 73.3–94.2, p<0.01).

Conclusions: With age, patients with sarcopenia and OA had a significant decrease in muscle mass and physical activity, an increase in the incidence of falls. Patients with sarcopenia had high CRP levels and vitamin D deficiency than patients without sarcopenia.

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Diagnostics and imaging procedures

FRI0554

WHICH AXIAL MAGNETIC RESONANCE IMAGING COMBINATION IS OPTIMAL FOR ASSESSING ACTIVITY IN SPONDYLOARTHRITIS?

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Background: None

Objectives: To determine the optimal axial Magnetic Resonance Imaging (MRI) combination for assessing disease activity in spondyloarthritis

Methods: In this single centre cross-sectional study, patients with a known diagnosis of axial spondyloarthritis were selected. Clinical activity was defined by an Ankylosing Spondylitis Disease Activity Score-CRP (ASDAS-CRP) ≥1.3. Bone marrow oedema was quantified by the Berlin spine score and the global score for sacroiliac joints (SIJ). The ASDAS-CRP and MRI activity evaluation of the full spine and SIJ were available in the entire cohort. Receiver operating characteristic curves were done to test the performance of different MRI combinations in identifying patients with ASDAS-CRP ≥1.3. Performance was interpreted as follows: 0.61–0.70=fair, 0.71–0.80=moderate. A pairwise comparison of the area under the curves (AUC) was made to rank these MRI scores according to their diagnostic performance.

Results: 44 patients were assessed (30 were men; mean age was 37 years; mean disease duration was 5.0 years; median serum CRP level was 4.0 mg/L; mean ASDAS-CRP was 2.6; n=36 with ASDAS≥1.3, and n=8 for ASDAS<1.3). MRI activity score (MRIAS) performance was moderate for thoracic spine alone and SIJ in combination with thoracic spine or thoraco-lumbar spine or cervico-thoracic spine or total spine. Performance was fair for SIJ alone and total spine alone. MRIAS yielded the highest specificity for SIJ alone (Se=44%, Sp=100%), and the highest sensitivity for thoracic spine alone (Se=89%, Sp=50%). MRIAS for SIJ in combination with the thoracic spine yielded the highest AUC (0.78, p=0.0002). However, no significant difference was observed between MRIAS with a moderate performance (p>0.05, whatever AUCs comparisons).

Conclusions: For assessing disease activity in axial spondyloarthritis MRI of the SIJ in combination with the thoracic spine performed as good as MRI based on a more extended imaging of the spine.

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FRI0555

MUSCLE ELASTOGRAPHY AS A POTENTIAL NOVEL IMAGING BIOMARKER IN MYOSITIS

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Background: Idiopathic inflammatory myopathies are a group of autoimmune muscle disorders characterised by muscle pain, stiffness and weakness. Diagnosis can be challenging; it relies on subjective clinical assessments, expensive MRI scans and invasive muscle biopsies. Novel quantitative ultrasound technologies like shear wave elastography could provide a new valuable non-invasive bedside imaging biomarker for diagnosis and management.

Objectives: 1-to determine if there are muscle elasticity differences between myositis patients and healthy controls. 2-to test the correlation between elasticity and measures of strength, function and muscle enzymes (disease activity).

Methods: Muscle elasticity, evaluated using shear wave velocity (SWV), was measured in 16 active myositis patients (5 males/11 females; 5 dermatomyositis, 5 polymyositis, 2 inclusion body, 4 undifferentiated) with a mean age of 51.3 years and 26 healthy controls (8 males/20 females) with a mean age of 42.0 years. Active myositis was defined as a decreased muscle strength and an elevated muscle enzyme. The investigated muscles included the four quadriceps [vastus lateralis (VL), rectus femoris (RF), vastus medialis (VM) and vastus intermedius (VI)], the three hamstrings [biceps femoris (BF), semitendinosus (ST) and semimembranosus (SM)] and the biceps brachii (BB). The myositis patients performed the expanded timed-get-up-and-go (ETGUG) test to assess walking function in addition to the handgrip strength and isokinetic knee extension/flexion tests to assess muscle strength. Mann-Whitney test and Spearman's correlation coefficients were utilised to test for difference and correlation respectively.

Results: Myositis patients had a significantly lower SWV (p<0.001) in all muscles except the BB (table 1 and figure 1). The mean elasticity difference ranged from 12% for VM to 21.1% for SM (table 1). Muscle enzyme (creatinine kinase) correlated with SWV for the VM (r=0.50; p=0.04) and BB (r=0.55; p=0.03). A strong correlation was detected between ETGUG walking time and VL (r=-0.73) as well as VI (r=-0.64). Handgrip strength correlated with VL, RF and BF (r=0.64, 0.56 and 0.62 respectively). There was, however, no significant correlation between SWV and isokinetic knee strength.