AB0368 PREDICTORS OF NEUROPATHIC PAIN IN RHEUMATOID ARTHRITIS

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Background: Significant pain persists in a substantial proportion of Rheumatoid Arthritis (RA) patients in spite of disease remission. Recent evidence indicates that features suggestive of neuropathic pain (NP) are present in RA patients with a prevalence range of 33–38% using the painDETECT questionnaire (PDQ).

Objectives: To estimate the clinical predictors of NP in a cohort of RA patients.

Methods: Observational, cross-sectional study was performed with RA patients followed at our Rheumatology department with unchanged DMARD treatment during the last 3 months. Patients with diagnosed neuropathy or non-RA risk factors for NP were excluded. Selected patients were evaluated in a medical visit. Demographic, clinical and laboratorial data were collected and disease activity and functional measures were evaluated. Two questionnaires were applied to assess NP: the Leeds Assessment of Neuropathic Symptoms (LANSS) and the PDQ. Univariate and multivariate logistic regression were performed to identify the predictors of NP. Significance level was set as <0.05 .

Results: 112 RA patients were included. 86 (77%) were females, with a mean (SD) age of 55.1 (10.8) years and median disease duration of 13 years (range: 2–41). 84% patients were seropositive for Rheumatoid Factor and/or ACPA. 102 (91%) were treated with DMARDs and 42% with a biologic DMARD, whom 8% in monotherapy. The mean (SD) DAS28 4V was 3.61 (1.01) and 12% were in remission. 45 (40%) patients had NP by the LANSS (≥ 12), 28% had a possible/likely NP in the PDQ (>12) and 21% were positive in the both tests. Female sex was predictive of LANSS and PDQ NP (OR: 3.44, $p=0.02$ and OR: 3.70; $p=0.05$, respectively) and disease duration was a predictor of LANSS (OR: 0.92 per year, $p=0.004$). After adjusting for these variables, pain VAS, patient global activity and the tender joint count were positive predictors of NP by both tests. Swollen joint count, ESR or CRP levels were not significantly associated with NP. DAS28 CRP and HAQ scores were both significant positive predictors of PDQ NP (OR: 1.77 and OR: 3.61, $p<0.01$, respectively). DAS28 CRP, dichotomized as remission/non-remission, and the HAQ score were also significantly positive predictors of LANSS NP (OR: 5.55, $p=0.01$ (DAS28 CRP ≥ 2.6); OR: 2.15, $p=0.03$). Positivity for ACPA was a negative predictor of LANSS NP (OR: 0.23, $p=0.009$), remaining significant after adjusting for DAS28 CRP, HAQ and current methotrexate (MTX). Number of analgesics and current NSAIDs treatment were associated with PDQ NP (OR: 2.72 and OR: 3.40, respectively, $p<0.05$). Current MTX and previous/current Hydroxychloroquine (HCQ) treatment were both negative predictors for PDQ NP (OR: 0.41 and OR: 0.20, respectively, $p<0.05$). No other significant associations were found. In a subgroup with dosed TSH levels ($n=18$), there was a positive though non-significant association with LANSS and PDQ (OR: 3.12, OR: 14.98, $p=0.09$).

Conclusions: NP was present in sizable proportion of RA patients. Consistently with previous data, our study supports the association between NP and disease activity/functional scores but not with objective inflammatory measures. This study newly points to a possible protective role of ACPA positivity, MTX and HCQ treatment in NP risk.

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AB0369 VITAMIN D STATUS AND DISEASE ACTIVITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: The purpose of the study was to define the associations between serum level of 25-hydroxyvitamin D (25(OH)D) and disease activity in patients with rheumatoid arthritis (RA).

Objectives: The study group comprised 93 patients aged 27–80 years suffering from RA (74.2% women) and 93 controls.

Methods: The levels of rheumatoid factor (RF) and C-reactive protein (CRP) were measured by immunoturbidimetric assay. Erythrocyte sedimentation rate (ESR) was measured by Westergren method. Serum 25(OH)D_{total} level was determined by electrochemoluminescence (ECL) method. The optimal vitamin D status was defined when serum 25(OH)D level was 30–50 ng/ml.

Results: In general, 54.8% of RA patients revealed vitamin D deficiency, and 37.6% - vitamin D insufficiency. No significant difference was found when mean serum 25(OH)D levels in RA patients and healthy controls were compared. 25(OH)D levels appeared markedly lower in patients with the highest activity of RA compared to values noted in patients with the minimal RA activity (16.55 $\pm$ 9.26 vs 22.59 $\pm$ 9.74 ng/ml, $p<0.05$). In RA patients 25(OH)D levels were significantly and negatively associated with markers of disease activity (DAS28-ESR (β =

-0.33; 95% CI = 0.05, -0.01), CRP (β = -0.23; 95% CI = -0.72; 0.00), and ESR (β = -0.26; 95% CI = -0.78; -0.10). All these associations remained statistically significant after adjustment for gender, age and BMI.

Conclusions: Vitamin D deficiency should be considered as an important predictor of the high RA activity (AUROC = 0.67; 95% CI = 0.513–0.83, $P=0.05$).

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AB0370 DEVELOPMENT OF PATIENT PREFERENCE PHENOTYPES FOR RHEUMATOID ARTHRITIS

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Background: Many important treatment decisions for patients with rheumatoid arthritis (RA) are conditional on patient preferences and, according to the U.S. National Academy of Medicine, mandate a shared decision making approach (SDM). Furthermore, SDM is being increasingly recognized as an important quality measure. One of the most common preference sensitive decisions in RA is how to escalate care when response to methotrexate monotherapy is inadequate. However, the number of RA medications currently approved makes it challenging for patients to weigh the pros and cons related to each of the treatment options in order to develop a preference.

Objectives: The objective of this study was to develop representative patient preference phenotypes to enable patient-physician dyads to effectively incorporate patient preferences at the point-of-care.

Methods: People living with RA were invited to complete a Choice-Based Conjoint analysis survey including seven attributes (route of administration, time to onset of action, bothersome adverse events (AEs), serious AEs, extremely rare AEs, duration of time on the market and affordability) developed iteratively based on patient feedback. Each attribute was described across three or four levels using plain language. Preference phenotypes were identified by applying latent class analysis to the conjoint data. Class solutions were replicated five times from random starting seeds. A five-group solution was chosen based on Akaike's information criterion. We calculated the percentage of importance assigned to each attribute and performed simulations to estimate preferences for triple therapy, SC and IV biologics, or tofacitinib.

Results: 1100 U.S. subjects recruited via the CreakyJoints online patient community completed the survey. Of these, 49 were eliminated because they completed the survey in less than 10 minutes and an additional 45 people were excluded because they did not respond correctly to a dominant choice task. The mean age was 51.7 (11.2). The majority were female; (92%) and Caucasian (93%). Preferences (assuming low cost across options), and the reasons underlying each respondent's preference, clustered into five groups (Figure 1). There were no differences in the distribution of demographic or clinical characteristics across the five groups. Phenotypes were created based on the stated preference data.

Figure 1. Relative Importances

Conclusions: RA patients' preferences vary and can be classified into distinct phenotypes. Ongoing research is evaluating whether enabling patients to identify with a preference phenotype facilitates SDM at the point-of-care.

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AB0371 THE QUALITY OF LIFE CAN BE IMPROVED BY FOREFOOT RECONSTRUCTION EVEN IN PATIENTS WITH WELL-CONTROLLED RHEUMATOID ARTHRITIS

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Background: The treatment aim of rheumatoid arthritis (RA) is achieving and

maintaining remission (REM) or low disease activity (LDA) via tight medical control¹⁾. However, despite remarkable advances in medication, progressive deterioration and deformity of the forefoot sometimes occur if adequate medication is not administered in the early stage. Surgical reconstruction is still required in patients with painful callosity and footwear problems caused by typical forefoot deformity. Recently, patients have expressed a desire to achieve functional REM with a higher quality of life (QOL) and improved mental wellness.

Objectives: The objective of this study was to clarify the systemic effects of forefoot reconstruction on the impaired foot, even in patients who have achieved REM or LDA.

Methods: A prospective cohort study was performed for 63 feet of 50 patients (males: 6, females: 44) with RA who underwent primary elective surgery between October 2012 and September 2014. Both feet underwent surgery on the same day in 13 patients. The average (range) age was 64 (42–89) years, and the average (range) disease duration was 20 (2–36) years. The procedures performed included shortening oblique osteotomy at the metatarsal neck of the lesser toes in 47 feet, first metatarsophalangeal joint arthroplasty (Swanson) in 44 feet, correction shortening osteotomy (modified Mitchell) at the first metatarsal in 4 feet, and fusion at the first interphalangeal joint in 7 feet, among others. A total of 30 feet in 27 patients (males: 5, females: 22) had a disease activity of REM or LDA just before surgery. The patient-reported outcomes (PROs) were assessed using the Health Assessment Questionnaire-Disability Index (HAQ-DI), EuroQoL-5 Dimensions (EQ-5D), Beck Depression Inventory-II (BDI-II), and Patient's General Health using a visual analogue scale of 100 mm (Pt-GH). The 28-joint Disease Activity Score using C reactive protein (DAS28-CRP), the Japanese Society of Surgery of the Foot (JSSF) standard rating system (JSSF) for the RA foot and ankle scale²⁾, and the Time Up&Go test (TUG) were also evaluated. All of these items were investigated just before surgery (baseline) and again at 6 and 12 months after surgery.

Results: Overall, the physical function (JSSF, TUG), QOL (EQ-5D), and mental wellness (depression) (BDI-II) were significantly improved at 6 and 12 months after surgery compared to the baseline values ($p < 0.05$). In the REM/LDA group, significant improvement was noted in the physical function (JSSF), QOL (EQ-5D) both at 6 and 12 months after surgery; however, we did not observe any significant changes in the Pt-GH or DAS28-CRP (Table 1).

Table 1: Outcome of surgical intervention in the deformed forefoot for the patients with rheumatoid arthritis

		HAQ-DI	EQ-5D	BDI-II	Pt-GH (mm)	DAS28-CRP	JSSF	TUG (sec)
Total n=50	baseline	0.98 (0.77)	0.71 (0.11)	11.7 (8.2)	30.4 (22.9)	2.63 (1.1)	61.9 (16.4)	10.0 (4.0)
	PO# 6mos.	1.01 (0.8)	0.75* (0.13)	9.9* (7.0)	25 (20.9)	2.43 (0.92)	78.7** (14.7)	9.2* (3.0)
	PO# 12mos	1.04 (0.71)	0.76* (0.15)	9.7* (6.9)	25.4 (19.7)	2.40 (0.89)	78.2** (14.3)	9.3* (3.0)
REM+LDA n=27	baseline	0.78 (0.66)	0.73 (0.13)	10.3 (7.8)	18.9 (18.6)	1.85 (0.49)	68.0** (15.4)	8.6 (2.4)
	PO# 6mos.	0.81 (0.65)	0.80* (0.13)	8.1* (6.3)	19.5 (16.7)	2.0 (0.60)	82.8** (11.5)	8.4* (2.0)
	PO# 12mos	0.89 (0.66)	0.80* (0.16)	8.7 (7.6)	19.4 (16.1)	2.0 (0.57)	81.4** (11.8)	8.4 (2.5)

Mean(SD) *: $p < 0.05$ compared to baseline, **: $p < 0.01$ compared to baseline

Conclusions: Achieving REM or LDA is not the ultimate goal of treatment for patients with painful callosity and footwear problem functional loss. A higher QOL and improved function can be achieved by surgical intervention in the deformed forefoot.

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AB0372 ASSOCIATED FACTORS OF CERVICAL AND LUMBAR SPINAL INSTABILITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Few studies have compared rheumatoid arthritis (RA)-related disorders of the cervical and lumbar spine.

Objectives: The objectives of this study were to examine the prevalence of and risk factors for cervical and lumbar spinal instability in patients with RA.

Methods: From a total of 1,843 patients registered in the Akita Orthopedic Group on Rheumatoid Arthritis (AORA), 135 patients [118 women, 17 men; mean age, 66 (41–84) years; mean disease duration, 14 (1–63) years] who underwent a radiographic examination were enrolled in this study. In the cervical spine, we defined instability as one of the following characteristics: (1) atlantodental interval (ADI) > 3 mm, (2) Ranawat value < 13 mm on a neutral plain radiograph, or (3) anteroposterior translation > 3 mm at the subaxial cervical spine on an anteroposterior bending plain radiograph. In the lumbar spine, instability was defined as anteroposterior translation > 3 mm on a neutral plain radiograph.

At the time of radiographs evaluation, demographic characteristics, clinical variables, medical history and current medications were investigated.

The patients were classified into two groups: with both cervical and lumbar spinal instabilities and without. The independent risk factors for both cervical and lumbar spinal instabilities were then determined using multivariate logistic regression analysis.

Results: Forty-six (34.1%) patients exhibited cervical spinal instability, and 50 (37.0%) patients exhibited lumbar spinal instability. Twenty-four patients (17.8%) exhibited both cervical and lumbar spinal instability. The presence of both cervical and lumbar spinal instability was significantly and independently associated with disease duration (OR: 1.06; 95% CI: 1.01–1.12).

Conclusions: The prevalence of both cervical and lumbar spinal instability in patients with RA was 17.8%. Disease duration was independent risk factor for presence of both cervical and lumbar spinal instability in this study.

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AB0373 ANALYSIS OF RISK FACTOR FOR LOCOMOTIVE SYNDROME IN PATIENTS WITH RHEUMATOID ARTHRITIS: DATA FROM CHIKARA STUDY

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Background: Patients with rheumatoid arthritis (RA) are at a higher risk for sarcopenia due to joint destruction and chronic inflammation*1, which can lead to locomotive syndrome (LS), i.e., being restricted in the ability to walk or lead a normal life owing to a dysfunction in one or more of the parts of the musculoskeletal system*2. The prospective observational CHIKARA study (Correlation research of sarcopenia, skeletal muscle and disease activity in rheumatoid arthritis; registration number UMIN000023744) was begun in 2016 to investigate the correlation between RA disease activity and sarcopenia and LS.

Objectives: We investigated the relationship between LS and disease activity at baseline in patients with RA.

Methods: One hundred patients (78% women; average age, 66y) enrolled in the CHIKARA study were examined for body weight, muscle mass, fat mass, predicted bone mass, basal metabolic rate (BMR), leg muscle score, etc., using a body composition analyzer. Laboratory data, disease activity, Health Assessment Questionnaire (HAQ) and treatment were also investigated. LS was diagnosed using a questionnaire called Locomo-5. We investigated the correlation between LS and each status using univariate and multivariate analyses.

Results: Fifty-two percent of the patients with RA that we examined had LS. Mean disease duration was 5.5 years and mean DAS28-ESR was 3.55. Table 1 shows the risk factors for LS. Univariate analysis showed that age, percent body fat, body weight, visceral fat rating, leg muscles score, rheumatoid factor status and HAQ had significant associations to LS. Leg muscle score and HAQ were detected as significant factors by multivariate analysis. Patients whose leg muscle score was less than 90 had a significantly higher prevalence of LS by ROC curve analysis (Odds ratio 3.77, $p = 0.001$). Disease activity and use of glucocorticoids or biological agents showed no significant relationship.

Table 1. Risk factors for locomotive syndrome in patients with rheumatoid arthritis

	Univariate		Multivariate		
	R	p value	Odds ratio	95% Confidence Interval	P value
Age, y	0.255	0.01	—	—	—
% body fat	0.244	0.014	—	—	—
% body water	-0.215	0.032	—	—	—
Visceral fat rating	0.205	0.041	—	—	—
Leg muscle score	-0.359	< 0.001	0.91	0.84–0.97	0.005
Rheumatoid factor	0.221	0.027	—	—	—
Health Assessment Questionnaire	0.460	< 0.001	8.78	2.66–29.0	0.001

Conclusions: Lower leg muscle score and higher HAQ score are independent risk factors for LS among patients with RA.

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