SAT0046

MODIFIED DISEASE ACTIVITY SCORE AT 3 MONTHS IS A SIGNIFICANT PREDICTOR FOR RAPID RADIOGRAPHIC PROGRESSION AT 12 MONTHS COMPARED WITH OTHER MEASURES

M. Movahedi^{1,2}, D. Weber¹, P. Akhavan¹, E. Keystone¹. ¹Division of Rheumatology, Mount Sinai Hospital, Toronto, Canada; ²Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Canada

Background: Progressive rheumatoid arthritis (RA) is responsible for joint damage causing disabilities with no agreement on which disease measures best predict radiographic progression

Objectives: We aimed to determine which disease activity measures including disease activity score (DAS), modified (M) DAS28 (CRP), clinical disease activity index (CDAI), and health assessment questionnaire disability index (HAQ-DI) best predict rapid radiographic progression (RRP) in early RA patients at baseline (BL) and 3 months.

Methods: PREMIER data, a 2-year, multicenter, double-blind active comparator-controlled study with methotrexate (MTX) naïve RA patients and active disease <3 years, were used. Only patients in the MTX arm were analyzed. RRP was defined as change in modified total Sharp (mTSS) > 3.5 at month 12. Logistic regression analysis assessed impact of measures at BL and 3 months on RRP at 12 months. Best cut-off points of M-DAS28(CRP) was also estimated using area under the receiver operating characteristic curve.

Results: 149 patients were included: female (n=113; 75.8%), positive RF (n=127; 85.2%), mean (SD) age 52.9 (13.3) years, disease duration 0.8 (0.9) year, DAS28(CRP) 6.3 (0.9). After adjusting for potential confounders, only M-DAS28(CRP) at BL (_{adj}OR=3.29; 95% CI: 1.70-6.36) and 3 months (_{adj}OR=2.56; 95% CI: 1.43-4.56) strongly predicted RRP at 12 months. M-DAS28(CRP) 4.5 and 2.6 at BL and 3 months maximized sensitivity and specificity for prediction of RRP.

Conclusion: M-DAS28(CRP) was a stronger predictor at BL and 3 months for RRP compared with other disease activity measures. Removing tender joint count and patient global assessment from DAS28(CRP) improves prediction of RRP.

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SAT0047

RISK FACTORS FOR THE POSTOPERATIVE DELAYED WOUND HEALING IN PATIENTS WITH RHEUMATOID ARTHRITIS TREATED WITH A BIOLOGICAL AGENT

S. Okita^{1,2,3}, H. Ishikawa², A. Abe², S. Ito², A. Murasawa², K. Nishida³, T. Ozaki³. ¹Okayama City Hospital, Orthopedic Surgery, Okayama, Japan; ²Niigata Rheumatic Center, Rheumatology, Shibata, Japan; ³Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences, Orthopedic Surgery, Okayama, Japan

Background: It has been suggested that perioperative use of biological disease-modifying anti-rheumatic drugs (bDMARDs) in rheumatoid arthritis (RA) patients carries risks for the surgical-site infection and the delayed wound healing (DWH); however, the risk of DWH with perioperative use of bDMARDs has not reached a general consensus.

Objectives: This retrospective study aimed to investigate the risk factors associated with DWH after orthopedic surgery in RA patients treated with bDMARDs.

Methods: We reviewed medical records of 277 orthopedic procedures for 188 RA patients treated with bDMARDs between from 2014 to 2017 in Niigata Rheumatic Center. As preoperative nutritional status assessment, we evaluated body mass index (BMI), prognostic nutritional index (PNI), and CONTrolling NUTritional status (CONUT). In addition, we evaluated DAS28-CRP, DAS28-ESR, face scale for pain, global health (GH), and Health Assessment Questionnaire-Disability

Index (HAQ-DI) to assess the disease activity. Univariate and multivariate logistic regression analyses were performed to evaluate the risk factor for DWH.

Results: The major characteristics of the patients in 277 procedures were mean age of 63.2 years old and mean disease duration of 18.2 years. Surgical site were hand and wrist (145 procedures), foot and ankle (76), hip and knee (31), elbow and shoulder (24), and spine (1). Seventy-four patients were treated with tocilizumab, 62 with etanercept, 55 with golimumab, 49 with abatacept, 16 with infliximab, 15 with adalimumab, and 6 with certolizumab. According to nutritional assessment in PNI and CONUT, 63% (n=175) and 47% (n=130) were normal nourished patients, respectively.

In 277 procedures, DWH were identified in 24 patients (8.6%). The following variables were significant in the univariate analyses: disease duration (OR 1.053; 95% CI 1.010-1.099; p=0.016), foot and ankle surgery (OR 7.091; 95% CI 2.130-23.603; p=0.001), tocilizumab (OR 0.286; 95% CI 0.093-0.881; p=0.029) (Table 1). These variables were entered into a multivariate model, and it was revealed that pre-operative use of tocilizumab (OR 0.265; 95% CI 0.074-0.953; p=0.042) and procedures in the foot and ankle (OR 6.915; 95% CI 1.914-24.976; p=0.003) were associated with an increased risk of DWH (Table 1).

Conclusion: As previous study on tocilizumab described, the current retrospective study suggested that pre-operative use of tocilizumab and procedures in the foot and ankle were risk factors for DWH. Pre-operative disease activity and nutritional status were not independent risk factors for an increase in the prevalence of DWH.

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Table 1. Risk factors for DWH after orthopedic surgery in RA patients treated with bDMARDs

	Univariable		Multivariable	
	OR (95% CI)	p value	OR (95% CI)	p value
Age	1.012 (0.967-1.059)	0.610		
Disease duration	1.053 (1.010-1.099)	0.016	1.035 (0.980-1.093)	0.220
Surgical site				
hand and wrist	Ref		ref	
elbow and shoulder	n.c.		n.c.	
hip and knee	n.c.		n.c.	
foot and ankle	7.091 (2.130-23.603)	0.001	6.915 (1.914-24.976)	0.003
Smoking	0.708 (0.085-5.905)	0.749		
Diabetes Mellitus	0.698 (0.150-3.252)	0.647		
DAS28-CRP	0.558 (0.302-1.029)	0.062		
HAQ-DI	0.986 (0.923-1.054)	0.686		
use of PSL	1.039 (0.343-3.147)	0.946		
bDMARDs				
TNF inhibitors	ref		ref	
tocilizumab	0.286 (0.093-0.881)	0.029	0.265 (0.074-0.953)	0.042
abatacept	0.370 (0.072-1.889)	0.232	0.515 (0.085-3.107)	0.469
PNI	0.986 (0.896-1.084)	0.767		
CONUT	0.892 (0.594-1.338)	0.580		

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SAT0048

THE CLINICAL USE OF F-18 NAF BONE PET/CT FOR EVALUATING DISEASE ACTIVITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

H.J. Park¹, J.W. Lee². ¹International St. Mary's Hospital, Catholic Kwandong University College of Medicine, Internal Medicine, Incheon, Korea, Rep. of (South Korea); ²International St. Mary's Hospital, Catholic Kwandong University College of Medicine, Nuclear Medicine, Incheon, Korea, Rep. of (South Korea)

Background: Bone positron emission tomography/computed tomography (PET/CT) using F-18 sodium-fluoride (NaF) has been widely used in various bone and joint diseases. However, only a few studies had evaluated the clinical implication of F-18 NaF bone PET/CT in patients with rheumatoid arthritis¹.

Objectives: The aim of our study is to investigate the clinical usefulness of F-18 NaF bone PET/CT for evaluating disease activity in patients with rheumatoid arthritis.

Methods: Seventeen patients with rheumatoid arthritis prospectively enrolled. All patients underwent whole-body F-18 NaF bone PET/CT and ultrasonography simultaneously. The baseline disease activity score with 28 joints using erythrocyte sedimentation rate (DAS28-ESR) and the results of blood tests were collected. From F-18 NaF bone PET/CT images, uptake of the 28 joints used in DAS28-ESR, expressed as standardized uptake value (SUV), and joint-to-normal bone uptake ratios of those joints were measured for each patient. Using SUV and joint-to-normal bone uptake ratios of the 28 joints, the relationship of bone PET/CT findings with clinical factors and ultrasonography findings were assessed.

Results: SUVs and joint-to-normal bone uptake ratios in the joints with active synovitis were significantly higher than those in the joints without definite synovitis ($p < 0.05$). The sum of SUVs and joint-to-normal bone uptake ratios of 28 joints showed significant positive correlations with DAS28-ESR as shown in Figure 1 and Figure 2 ($p < 0.001$ and correlation coefficient 0.775 for SUV; $p < 0.001$ and correlation coefficient = 0.828 for joint-to-normal bone uptake ratio) and patient global assessment score ($p = 0.002$ and correlation coefficient 0.697 for SUV; $p = 0.002$ and correlation coefficient = 0.705 for joint-to-normal bone uptake ratio). On correlation analysis with blood test results, only serum ESR level showed a positive correlation with the sum of joint-to-normal bone uptake ratios of the 28 joints ($p = 0.047$; correlation coefficient = 0.470) and other serum markers showed no significant association with bone PET/CT results ($p > 0.05$). On correlation analysis with ultrasonography findings, both power Doppler and gray-scale joint inflammation scores showed significant positive correlations with both the sum of SUVs and joint-to-normal bone uptake ratios of ultrasonography-examined joints ($p < 0.05$).

Figure 1. Correlation between the sum of SUVs of 28 joints in F-18 NaF bone PET/CT and DAS28-ESR ($p < 0.001$ and correlation coefficient 0.775)

Figure 2. Correlation between the joint-to-normal bone uptake ratio of 28 joints in F-18 NaF bone PET/CT and DAS28-ESR ($p < 0.001$ and correlation coefficient = 0.828)

Conclusion: The sum of joint uptake on F-18 NaF bone PET/CT has significant positive correlations with DAS28-ESR, serum ESR level, and ultrasonography findings in patients with rheumatoid arthritis. The findings on F-18 NaF bone PET/CT might be used as an imaging biomarker for disease activity of rheumatoid arthritis.

References:

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SAT0049

DIFFERENCES BETWEEN EARLY AND ESTABLISHED RHEUMATOID ARTHRITIS IN TIME TO ACHIEVING CDAI BUT NOT FATIGUE LOW DISEASE ACTIVITY AND REMISSION: DATA FROM THE OBRI REGISTRY

J. Pope¹, M. Movahedi^{2,3}, E. Rampakakis⁴, A. Cesta², J. Sampalis⁴, C. Bombardier^{2,5,6} on behalf of OBRI investigators. ¹University of Western Ontario, Saint Joseph's Health Care, London, Canada; ²Toronto General Hospital Research Institute, University Health Network, Toronto, Canada; ³Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Canada; ⁴JSS Medical Research, St-Laurent, Canada; ⁵Department of Medicine and Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Canada; ⁶Division of Rheumatology, Mount Sinai Hospital, Toronto, Canada

Background: Previous studies have shown that early diagnosis and treatment of rheumatoid arthritis (RA) is important for achieving comprehensive disease control and have identified established disease as an independent predictor of worse clinical outcomes. However, it is not clear whether these differences are driven by patient-reported or objective outcome measures.

Objectives: The aim of this analysis was to compare the time to achieving low disease activity (LDA) and remission based on both objective and patient-reported outcomes in people with early vs. established RA followed in routine clinical care.

Methods: RA patients enrolled in the Ontario Best Practices Research Initiative (OBRI) registry that were not in a low disease state at baseline based on the CDAI, SJC28, PtGA, pain and fatigue criteria below, and had at least six months of follow-up, were included in the analysis. LDA was defined as CDAI $\leq$ 10, SJC28 $\leq$ 2, TJC28 $\leq$ 2, PtGA $\leq$ 2cm, pain $\leq$ 2cm, fatigue $\leq$ 2cm, and MDGA $\leq$ 2cm; remission was defined as CDAI $\leq$ 2.8, SJC28 $\leq$ 1, TJC28 $\leq$ 1, PtGA $\leq$ 1cm, pain $\leq$ 1cm, fatigue $\leq$ 1cm, and MDGA $\leq$ 1cm. Between group (early vs. established) differences in time to first LDA/remission were assessed with Kaplan-Meier survival analysis and the log-rank test.

Results: A total of 986 patients were included, 347 (35%) with early RA and 639 (65%) with established RA. At baseline, patients with early RA were significantly younger (55.8 vs. 58.3 years) and were less likely to have a comorbidity (94.5% vs. 97.5%) or an erosion (26.7% vs. 62.6%), be RF-positive (65.6% vs. 74.2%), use bDMARDs (7.5% vs. 26.6%), and be non-smokers (38.9% vs. 47.3%).

Time to achieving LDA based on CDAI (HR [95%CI]: 1.23 [1.07,1.43]), SJC28 (1.32 [1.15,1.51]), TJC28 (1.18 [1.02,1.36]), MDGA (1.28 [1.10,1.49]), PtGA (1.23 [1.05,1.44]), and pain (1.29 [1.09,1.52]) were significantly shorter in early RA compared to established RA. Similarly, time to achieving remission based on CDAI (HR [95%CI]: 1.50 [1.22,1.84]), SJC28 (1.35 [1.17,1.55]), MDGA (1.25 [1.06,1.47]), PtGA (1.22 [1.02,1.47]), and pain (1.37 [1.14,1.65]) were significantly shorter in early RA. However, no differences were observed in time to remission based on TJC28 (1.12 [0.96,1.31]) and either LDA or remission based on fatigue (LDA 1.10 [0.94,1.30]; remission 1.09 [0.92,1.31]).

Adjustment for age, gender, presence of comorbidities, and baseline scores did not alter the results.

Conclusion: Time to achieving low disease state or remission based on various objective and patient-reported measures is significantly shorter in early compared to established RA with the exception of fatigue.

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