AB0195

FACTORS RELATED TO RADIOGRAPHIC PROGRESSION IN PATIENTS WITH RHEUMATOID ARTHRITIS-RELATED INTERSTITIAL LUNG DISEASE

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Background: Interstitial lung disease is an important cause of mortality and morbidity for RA. Lung computerized tomography (CT) is a valid method for the detection of interstitial lung disease (ILD) in rheumatoid arthritis (RA) patients. Besides, CT may have a role in the detection of progression in RA-ILD.

Objectives: To compare the clinical and radiological features of RA-ILD patients with and without radiographic progression according to lung CT.

Methods: From the hospital database, all patients recorded as having RA according to ICD-10 code and had a lung CT examination were recruited. RA was confirmed in 822 of 2305 (35.6%) records. Three radiologists re-evaluated lung CTs and 156/822 (18.9%) patients with had RA-ILD. Of these 156 patients, 101 (64.7%) had at least 1 follow-up long CT and these patients were included to analysis. Demographic and clinical data of the patients were recorded. ILD was divided into 3 main groups by radiologists: Usual interstitial pneumonia (UIP), non-specific interstitial pneumonia (NSIP) and airway disease (AD) (bronchiectasis and/or bronchiolitis without parenchymal involvement). Avila et al reported a grading system to assess the severity of ILD using HRCT (1). In our study we utilized a similar method using interlobular septal thickening, ground glass opacities, reticulations, traction bronchiectasis and honeycomb appearance as elementary findings to evaluate the RA associated ILD. Septal thickening, reticulations and ground glass opacities were considered as relatively mild features whereas traction bronchiectasis and honeycomb appearance were considered as severe findings as those frequently result from advanced fibrosis. The lungs were divided into upper, middle and lower zones each with equal number of slices. Progression was defined as involvement of more zones in vertical extent by the same elementary findings or emergence of more severe findings (i.e traction bronchiectasis or honeycomb appearance) in the same zones compared to previous exam. For the multivariate analysis, the possible factors identified with univariate analyses were further entered into the logistic regression analysis to determine independent predictors of radiographic progression.

Table. Comparison of demographic, clinical and radiographic characteristics of patients with and without radiographic progression

	Radiographic Progression (+)	Radiographic Progression (-)	p
n (%)	42 (41.5)	59 (59.5)	
Male n (%)	19 (45.2)	15 (25.4)	0.038
Age at RA diagnosis [year] (SD)	57.0 (11.0)	54.5 (11.2)	0.25
Age at ILD diagnosis [year] (SD)	62.3 (8.0)	61 (9.0)	0.63
Elapsed time between RA and ILD [year] (SD)	4.3 (6.9)	6.1 (7.2)	0.22
RA disease duration [year] (SD)	10.4 (7.5)	11.8 (7.8)	0.77
ILD disease duration [year] (SD)	5.7 (3.5)	5.4 (3.8)	0.67
Smoking (current or ever) n (%)	21/36 (58.3)	27/52 (51.9)	0.55
Rheumatoid factor (+) n (%)	37/40 (92.5)	55/58 (94.8)	0.64
Anti-CCP (+) n (%)	14/22 (63.6)	28/37 (75.7)	0.32
Dyspnea n (%)	21 (53.8)	22 (41.5)	0.24
ILD pattern			
- UIP	30/42	30/59	0.12
- NSIP	9/42	22/59	
- AD	3/42	7/59	
ILD at lung X-Ray n (%)	36/40 (90.0)	33/49 (67.3)	0.011
Rheumatoid Lung Nodule n (%)	20 (47.6)	26 (44.8)	0.78
CT findings			
- Ground Glass Opacities, n (%)	40 (95.2)	44 (74.6)	0.006
- Bronchiectasis, n (%)	29 (69.0)	40 (67.8)	0.89
- Reticular densities, n (%)	37 (88.1)	46 (78.0)	0.19
- Interseptal thickening, n (%)	18 (43.9)	20 (33.9)	0.31
- Honeycombing, n (%)	26 (62.0)	24 (46.1)	0.03
Treatment			
- Methotrexate (ever), n (%)	25 (59.5)	49 (83.1)	0.008
- Leflunomide (ever), n (%)	29 (69.0)	49 (83.1)	0.10
- Biologic DMARD (ever) n (%)	18 (43.0)	25 (42.4)	0.98
- Anti TNF (ever) n (%)	11 (26.2)	13 (22.0)	0.62
- Rituximab (ever) n (%)	13 (31.0)	12 (20.3)	0.22
Death n (%)	15 (35.7)	12 (20.3)	0.085

Results: In this study, 101 patients with 215 lung CT were included to analysis. 67 (66.3%) patients had 3 CTs, 30 (29.9%) patients 4 CTs and 17 (16.9%) patients had 5 CTs. Mean duration between first and last CT was 47.7±38.8 months. Of 101 patients, radiographic progression was seen in 42

(41.6%) patients. Univariate comparison of demographic, clinical and radiographic features of patients with or without radiographic progression were given in Table. In multivariate analysis (adjusted for ILD disease duration) having ground-glass opacity (aOR 8.6; CI: 1.65-44.9; p=0.011), male gender (aOR 2.9; CI: 1.13-7.4; p=0.026) were found as independent risk factors radiographic progression, while taking methotrexate (ever) (aOR 0.21; CI: 0.07-0.6; p=0.04) was found as an independent protector factor for radiographic progression.

Conclusion: The prediction of ILD progression in RA patients were a challenge for clinicians. According to lung CT, baseline ground-glass opacities looks like prominent factor for ILD progression, particularly at male RA patients. Using methotrexate in ILD patients is a dilemma in routine practice, our results demonstrate that methotrexate (not other cs or bDMARDs) is protective drugs for ILD progression, however these results should be confirmed in the further studies.

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AB0196

THE ASSOCIATION BETWEEN OSTEOPOROSIS AND FUNCTIONAL IMPAIRMENT EVALUATED BY THE LOCOMO25 IN RHEUMATOID ARTHRITIS

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Background: Locomotive syndrome is a condition in which activities of daily living are affected by impairment of the motor organs, most often due to rheumatoid arthritis (RA). Locomo25 is a new index developed for the early detection of locomotive syndrome. It consists of 25 items associated with pain, physical activity, and subjective state of health, with a score of 7 points or higher classed as Grade 1 locomotive syndrome and a score of 16 points or higher as Grade 2. In RA, joint impairment causes the appearance of problems affecting motor organs as a whole, as well as progressive functional impairment. As functional impairment progresses, it causes increasing immobility, which raises the risk of osteoporosis.

Objectives: Locomo25 was used to investigate functional impairment and its association with RA disease activity and osteoporosis indicators.

Methods: The subjects were 105 patients with RA (24 men and 81 women) with a mean age of 68.7 (28–91) years. In terms of staging, 25 were Stage I, 22 Stage II, 17 Stage III, and 41 Stage IV, and their motor disability was Steinbrocker Class 1 in 68 cases, Class 2 in 27, Class 3 in 9, and Class 4 in 1. Disease activity according to the Disease Activity Score 28 with erythrocyte sedimentation rate (DAS28 ESR) was assessed as remission in 44 cases, low disease activity in 24, moderate in 33, and high in 4. The associations between the Locomo25 score and disease activity indices, bone mineral density (BMD), and bone turnover markers (TRACP-5b, NTX, urinary DPD, BAP, total P1NP, and 25(OH)D) were investigated.

Results: Locomo25 grade was 0 in 37 cases (35.2%), 1 in 24 (22.9%), and 2 in 44 (41.9%). Locomo25 grade was significantly associated with Steinbrocker class ($r = 0.4299$, Spearman's rank correlation coefficient, $p < 0.0001$). DAS28 ESR and Health Assessment Questionnaire scores increased as locomotive syndrome progressed. There was no significant difference in eGFR between groups, but bone resorption markers (TRACP-5b, NTX, and urinary DPD) and a bone quality marker (pentosidine) decreased significantly as locomotive syndrome progressed. There were no significant differences in BMD or other bone turnover markers.

Conclusion: The Locomo25 score was useful for evaluating functional impairment in RA. The prevalence of Grade 2 locomotive syndrome in the general population is reported to be around 25%, and many patients with RA had advanced locomotive syndrome. Although there was no significant difference in BMD, elevated bone resorption and deteriorating bone quality were associated with progressive functional impairment, suggesting that RA patients with advanced locomotive syndrome may be at risk of increasingly severe osteoporosis as a result of immobility.

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AB0197

INCREASED CIRCULATING ADIPONECTIN IS AN INDEPENDENT DISEASE ACTIVITY MARKER IN PATIENTS WITH RHEUMATOID ARTHRITIS: A CROSS-SECTIONAL STUDY USING THE KURAMA DATABASE

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Background: Adiponectin is a major adipokine with pleiotropic effects on inflammatory conditions including rheumatoid arthritis (RA). Adiponectin generally has anti-atherogenic effects, and its serum level inversely correlates with body mass index (BMI) and visceral fat area (VFA). On the other hand, several studies have indicated a deleterious role of adiponectin in RA progression [1]. Recently, both low BMI and increased serum adiponectin have been reported as poor prognostic factors of RA [2, 3]. However, large-scale surveys have not been done focusing on both BMI and serum adiponectin, and it is unclear which factor provides further contribution to RA disease activity. In addition, the effects of biological disease-modifying antirheumatic drugs (bDMARDs) and Janus kinase (JAK) inhibitors on serum adiponectin are largely unknown.

Objectives: To clarify the relationship among serum adiponectin, body composition, current disease activity and therapeutic agents of RA.

Methods: We conducted a cross-sectional study in RA patients under treatment with agents including bDMARDs and JAK inhibitors. A total of 351 subjects from the Kyoto University RA Management Alliance cohort (KURAMA) were enrolled. We classified the participants into five body composition groups (overweight with or without visceral adiposity, normal with or without visceral adiposity, and underweight), according to the cut-off points for obesity and visceral fat used in Japan: BMI, 18.5 kg/m² for underweight and 25.0 kg/m² for obesity, and VFA, 100 cm² for visceral adiposity. Differences of continuous variables among the five groups were assessed by the Steel-Dwass test or one-way analysis of variance (ANOVA). We adopted a multiple standardized linear regression model to analyze effects of serum adiponectin level on DAS28-ESR.

Results: Serum adiponectin levels (20.9±12.5 vs. 14.7±8.4 µg/ml, *p* < 0.001) and DAS28-ESR (3.04±1.0 vs. 2.63±0.9, *p* = 0.017) in the underweight group were significantly higher than those in the others. In multiple regression analysis, serum adiponectin level, but not BMI, was positively correlated with DAS28-ESR (estimate = 0.0127, *p* = 0.0258). Subanalysis also showed that the use of bDMARD or JAK inhibitor did not have an obvious influence on circulating adiponectin.

Conclusion: In the multiple regression analysis we revealed a positive and independent correlation between serum adiponectin and DAS28-ESR in Japanese RA patients. Thus, serum adiponectin is an potential marker reflecting high disease activity of RA regardless of current medications.

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AB0198

SMOKING AND POSITIVITY OF RHEUMATOID FACTOR AND ANTI-CYCLIC CITRULLINATED PEPTIDE ANTIBODY IN THE GENERAL POPULATION

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Background: It is well known that rheumatoid arthritis (RA) occurs due to environmental risk factors in addition to genetic risk factors. Rheumatoid factor (RF) and anti-cyclic citrullinated peptide antibody (ACPA) are strongly associated with RA, and these biomarkers could turn to be positive before development of clinical symptoms. While smoking, particularly Brinkman index (BI) is well known as a risk factor for RA and ACPA positivity, it is still unclear whether smoking intensity or smoking duration contribute more to positive RF and ACPA.

Objectives: This study aims to evaluate risk factors for RF and ACPA positivity in the general population. It also describes whether smoking intensity, duration, and BI are significant.

Methods: This is a cross-sectional, observational, single center study. We reviewed the baseline characteristics of the general population who checked RF and ACPA at Preventive Medicine Center in St. Luke's International Hospital, Tokyo, Japan from January 2004 to December 2018.

The data for basic demographics, dietary habit, smoking intensity, smoking duration, BI, and blood tests including RF and ACPA were extracted. The data was analyzed statistically.

Results: A total of 127472 people who checked RF are included. Of these 127472 people, 64504 (50.6%) are male and the mean age was 44.9 years. RF was positive in 11477 people (9.0%). Among these, 1667 (1.2%) were checked for ACPA, and 21 people (1.3%) had positive ACPA. None of variables demonstrated significant association with RF positivity. In contrast, BI and smoking duration was significantly associated with an increased risk of ACPA positivity (13.3 years vs 7.49 years, *p* value = 0.023), although the number of cigarettes smoked was not. The smoking duration for 10 years or more was associated with an increased risk of ACPA positivity even after adjusted for age and sex (adjusted hazard ratio: 2.47 [95% confidence interval: 1.04-5.87]; *p*=0.04).

Conclusion: In this study, no significant risk factor for positive RF was found. Even smoking was not associated with RF positivity. On the other hand, smoking duration, not smoking intensity was significantly associated with an increased risk of ACPA positivity.

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