Conclusion: Rheumatoid arthritis patients are in increased risk of CV disease. PWV is considered as an independent risk factor of CVD. We proved increased arterial stiffness and vascular ageing in comparison to healthy controls. We did not find correlation between increased arterial stiffness and disease activity. All CVD risk factor intervention is necessary to improve the prognosis of patients. Further investigation is needed to establish the role of increased PWV in RA patients.

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AB0265

REDUCTION OF APPENDICULAR SKELETAL MASS INDEX IS A PREDICTOR OF FRACTURE IN PATIENTS WITH RHEUMATOID ARTHRITIS BASED ON THE THREE-YEAR FOLLOW-UP DATA OF THE CHIKARA STUDY

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Background: Patients with rheumatoid arthritis (RA) have lower muscle mass¹ and a higher risk of fragility fracture² compared with healthy individuals. The predictors for fractures among baseline data and the chronological changes of disease activity, body composition, and muscle mass are unknown.

Objectives: The predictors for fractures were investigated over a 3-year period in a longitudinal study.

Methods: The 3-year follow-up data from a prospective observational study (CHIKARA study: Correlation research of sarcopenia, skeletal muscle and disease Activity in Rheumatoid Arthritis) were used. The patients' fractures were counted, and correlations between fractures and disease activity, body composition, and sarcopenia were investigated. Muscle mass, body fat mass, total body water, bone mass, and basal metabolic rate were measured using a body composition analyzer. The fracture-free survival rate was calculated. The relationships between fractures and each parameter at baseline and the changes over the 3-year period (Δ) were investigated by univariate and multivariate analyses.

Results: A total of 100 patients (78 female, average age 68 years) were enrolled in this study; 12 patients (10 female and 2 male) had fractures during the 3-year follow-up, and the fracture-free survival rate was 86.9%. The Δ modified Health Assessment Questionnaire (mHAQ), Δ weight, Δ muscle mass, Δ estimated bone mass, Δ basal metabolic rate, and Δ appendicular skeletal muscle index (ASMI) were predictors for fractures. On the other hand, body composition, disease activity, and sarcopenia at baseline were not correlated with fractures (Table 1). The Δ ASMI was an independent predictor for fractures on multivariate analysis (odds ratio:0.015, $P=0.026$). The estimated cut-off value of the Δ ASMI was 0.14 kg/m² on receiver operating characteristic curve analysis (Figure). When the Δ ASMI decrease was greater than or equal to 0.14 kg/m² for three years, the odds ratio of fractures was significantly increased 9.8-fold, compared to a Δ ASMI decrease less than 0.14 kg/m² ($P=0.001$).

Table 1. Predictors for fractures in patients with RA

	Univariate	
	R value	P value
Baseline		
Age, year	0.172	0.087
DAS28-ESR	-0.083	0.411
mHAQ	0.077	0.447
Weight, kg	0.021	0.837
Muscle mass, kg	-0.0035	0.728
Estimated bone mass, kg	-0.020	0.845
Sarcopenia	-0.093	0.356
Change of 3-year period		
Δ DAS28-ESR	0.187	0.088
Δ mHAQ	0.224	0.040
Δ Weight, kg	-0.224	0.045
Δ Muscle mass, kg	-0.253	0.023
Δ Estimated bone mass, kg	-0.236	0.034
Δ Basal metabolic rate, kcal/day	-0.248	0.025
Δ Appendicular skeletal muscle index, kg/m ²	-0.352	0.001

Conclusion: The fracture-free survival rate was 86.9% in this 3-year longitudinal study. It was difficult to predict future fractures from the baseline data. Reduction of the ASMI was an independent predictor for fractures. Alleviating muscle mass loss may prevent fractures.

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AB0266

ANALYSIS OF STRESS AND FATIGUE IN PATIENTS WITH RHEUMATOID ARTHRITIS USING A DIGITIZING DEVICE

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Background: Stress and fatigue are evaluated subjectively by patients using a visual analog scale (VAS) and questionnaires such as the SF-36 and the FACIT Fatigue Scale. Such evaluations are based on patients' self-reported outcomes. It is difficult to evaluate stress and fatigue objectively. A digitizing device was used to quantify stress objectively.

Objectives: To evaluate the correlations of a digitizing device and a VAS or a questionnaire about stress and fatigue, and the relationships with disease activity of patients with rheumatoid arthritis (RA).

Methods: Data from a prospective observational study (CHIKARA study: Correlation research of sarcopenia, skeletal muscle and disease Activity in Rheumatoid Arthritis) were used. The study protocol was reported previously¹. A total of 84 RA patients entered the study and were evaluated using a stress digitizing device (Smart Pulse, MEDICORE Co. LTD). This device evaluates stress based on heart rate variability theory². The objective physical stress score (O-physical ST), mental stress score (O-mental ST), and total stress score (O-total ST) were calculated, ranging from 0 to 100 (higher score indicating greater stress). A questionnaire for stress, the Perceived Stress Scale³ (PSS) 10 Japanese version (minimum 0, maximum 40), and VAS evaluations of stress (stress-VAS) and fatigue (fatigue-VAS) were carried out. The correlations between subjective and objective methods were analyzed. The relationships between stress, fatigue, and disease activity of RA patients were examined.

Results: The patients' mean age was 68.6 years (women n=66, men n=18), disease duration was 8.8 years, DAS28ESR was 3.24, and modified Health Assessment Questionnaire (mHAQ) was 0.5. The average PSS10 was 26.1, which was higher than in healthy individuals (20.3). The fatigue-VAS was higher than the stress-VAS (41.3 vs 34.5 mm). The O-physical ST score was similar to the O-mental ST score (39.5 vs 37.4). Correlations are shown in Table. The O-physical ST was positively correlated with the fatigue-VAS ($R=0.243$ $p=0.026$), and the O-mental ST was also positively correlated with the stress-VAS ($R=0.267$ $p=0.014$). However, there was no correlation between the PSS10 and objective stress parameters. The DAS28-ESR was correlated with the fatigue-VAS ($R=0.223$ $p=0.041$) and the O-total ST ($R=0.329$ $p=0.002$). The stress scale (O-total ST) was worse with moderate and high disease activity than in remission (Figure).

Conclusion: The stress score obtained by an objective digitizing device was correlated with stress- and fatigue-VAS scores. However, there was no correlation with the PSS10 questionnaire. It was found that the fatigue-VAS score and the objective total stress score were high with worse disease control.

Disease activity and stress scale

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Table. Correlation coefficients of subjective and objective evaluations of stress and fatigue in patients with RA

	PSS10	Stress-VAS	fatigue-VAS	O-physical ST	O-mental ST	O-total ST
PSS10		0.580**	0.404**	0.066	0.055	0.004
Stress-VAS			0.673**	0.007	0.267*	0.023
Fatigue-VAS				0.243*	0.059	0.160
O-physical ST					-0.224*	0.708**
O-mental ST						-0.017
O-total ST						

*: $p<0.05$, **: $p<0.01$, Spearman rank correlation coefficient

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AB0267

BODY COMPOSITION IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Rheumatoid arthritis (RA) is a complex inflammatory disease that modifies body composition. Using the dual-energy x-ray absorptiometry (DXA) in RA patients could be a method for body composition changes detection.

Objectives: To study the body composition using DXA in patients with RA.

Methods: The study involved 79 women with RA, median age 60 [55; 65] years. The bone mineral density (BMD) was measured by dual-energy x-ray absorptiometry using «Discovery A» (Hologic, USA). Assessment of body composition was carried out, using the program «Whole body». Sarcopenia (SP) was diagnosed as a decrease in appendicular mass index (AMI) <6.0 kg/m². Osteoporosis (OP) was diagnosed as a decrease in T-score <-2.5 SD. Osteosarcopenia was determined when T-score was <-1.0 SD, AMI was <6.0 kg/m², osteosarcopenic obesity - T-score was <-1.0 SD, AMI was <6.0 kg/m² and total fat was $>35\%$.

Results: The mean duration of RA was 9 [3; 11] years. The mean body mass index (BMI) was 27.6 ± 4.8 kg/m². Disease activity score in 28 joints-erythrocyte sedimentation rate was 4.5 ± 1.3 points for the group. 39 (49.3%) patients used oral glucocorticoids continuously. Appendicular muscle mass and AMI were on average 17.8 ± 3.0 kg and 6.8 ± 1.0 kg/m², respectively. AMI <6.0 kg/m² was detected in 20 (25.3%) patients. 56 (70.9%) women with RA had total fat $>35\%$, while only 22 (27.8%) of women with RA had obesity according to BMI (BMI >30 kg/m²). Isolated OP was found in 13 (16.5%), osteosarcopenia in 7 (8.9%) and osteosarcopenic obesity in 13 (16.5%) patients RA. No cases with isolated sarcopenia or sarcopenic obesity were detected. Only 3 (3.8%) patients did not have appendicular muscle mass, AMI and BMD decrease and overfat or obesity.

Conclusion: About 97% women with RA had abnormal body composition phenotype: 16.5% - OP, 8.9% - osteosarcopenia, 16.5% - osteosarcopenic obesity and 54.4% - overfat.

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AB0268

HUMAN T-CELL LEUKAEMIA VIRUS TYPE 1 MAY INVALIDATE T-SPOT.TB RESULTS AMONG RHEUMATOID ARTHRITIS PATIENTS: A RETROSPECTIVE OBSERVATIONAL STUDY

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Background: In clinical rheumatology, interferon- γ release assays (IGRAs) have been reported as a useful diagnostic test for latent tuberculosis infection (LTBI) before beginning the administration of biologics such as anti-TNF therapies (1). CD4-positive T cells are the main target in Human T-cell leukaemia virus type 1 (HTLV-1) infection. Several reports suggest that the reaction of tuberculin skin test (TST) is attenuated in HTLV-1-positive individuals compared with that in HTLV-1-negative individuals (2). However, it remains unclear whether IGRAs are reliable for detecting TB infection among HTLV-1-positive RA patients.

Objectives: The present study aimed to investigate the usefulness of the T-SPOT.TB assay in HTLV-1-positive RA patients. In addition, the association between the existence of IFN- γ producing T cells and HTLV-1 proviral loads (PVLs) in HTLV-1-positive RA patients was analysed on the basis of the T-SPOT.TB assay results.

Methods: We reviewed the medical records of 75 HTLV-1-negative and 29 HTLV-1-positive RA patients who were suspected cases of LTBI and evaluated using the T-SPOT.TB assay as a clinical practice from April 2012 to July 2019. The results of T-SPOT.TB were collected from medical records, retrospectively. Peripheral blood samples were obtained from HTLV-1-positive RA patients for the analysis of HTLV-1 PVLs values. The study protocol was approved by the research ethics committees of our hospitals.

Results: Approximately 55% of the HTLV-1-positive RA patients showed invalid results for the T-SPOT.TB assay ($p < 0.0001$); the cause of invalid results was a spot-forming count of >10 spots in the negative controls of the T-SPOT.TB assay among HTLV-1-positive RA patients. Among HTLV-1-positive RA patients, HTLV-1 PVL values were significantly higher in 16 patients who showed invalid results than in 13 patients who did not ($p = 0.003$). There were no between-group differences in female patient ratio, age, RA disease activity and therapeutic regimens. IFN- γ producing cells were detected in the peripheral blood of HTLV-1-positive RA patients without stimulation with TB-specific antigens.