replaced MCP joint to a more extended position [2]. However, since the correlation between extension deficit of PIP join and MCP joint flexion range was not actually observed, it is unlikely that a decrease in the extension of the PIP joint is a result of compensation. There is a possibility that the procedure such as intrinsic tendon release, bone shortening by resection of metacarpal head, and centralization of extensor tendon [3], might influence the postoperative PIP joint motion. It is necessary to pay attention to changes in the ROM of the PIP joint after joint replacement arthroplasty of MCP joint.

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SAT0083 TOCILIZUMAB INDUCED CLINICAL REMISSION IN RHEUMATOID ARTHRITIS HAD MORE RESIDUAL DOPPLER SIGNALS IN COMPARISON WITH OTHER BIOLOGICS

Y. Hara[1], Y. Ishida[1], Y. Yamaguchi[1], Y. Yoshimine[1], T. Wibowo[1], Y. Manabe[1], M. Yaga[2], K. Kawamoto[1], H. Nakahara[1], S. Higa[1], T. Igarashi[1], K. Maeda[1], A. Ogata[1]. *[1]Division of Allergy, Rheumatology and Connective Tissue Diseases, Department of Internal Medicine; [2]Respiratory Medicine, Department of Internal Medicine, Ntt West Osaka Hospital, Osaka, Japan*

Objectives: To study the residual Power Doppler (PD) signals for assessing synovitis in CRP negative patients with rheumatoid arthritis (RA) treated with biologics.
Methods: Biologics treated RA patients who were maintained normal CRP for more than 6months (34 TNF inhibitors, 37 Tocilizumab, 23 Abatacept) were assessed by ultrasonography. Residual PD signals were assessed in MCP, PIP, and wrist joints with both hands. We assumed patients who had any PD signals in assessed joints were “residual PD signals”.
Results: All treated patients with biologics maintained normal CRP for a half year (n=94). 35.1% of patients treated with biologics had positive PD signals. The remission rates of DAS28-ESR, CDAI, and Boolean were 68.7%, 62.8%, and 48.9% respectively. 28.1% of patients who achieved DAS28-ESR remission had residual PD signals, 22.0% in CDAI, and 21.7% in Boolean. 23.8% of patients treated by TNF inhibitors who achieved DAS28-ESR remission had residual PD signals, 34.6% in Tocilizumab, and 20.0% in Abatacept. In case of setting the DAS28-ESR remission less than 3.0, 30.2% of patients who achieved DAS28-ESR remission had residual PD signals, 29.0% in less than 2.0, and 12.5% in less than 1.5. The patients who have no tender or swollen joints and the excellent patient oriented global health assessment (VAS score was zero) had fewer residual PD signals (23.4% vs 58.6% in tender joints, 26.7% vs 66.7% in swollen joints, and 13.3% vs 44.4% in patient VAS).

Table 1. Rate of remission and residual PD signals

	All biologics	TNF inhibitors*	Tocilizumab	Abatacept
Patients number	94	34	37	23
Residual PD signals**	33/94 (35.1%)	9/34 (26.4%)	15/37 (40.5%)	9/23 (39.1%)
DAS28-CRP remission				
Achieved***	78/94 (83.0%)	32/34 (94.1%)	31/37 (83.8%)	15/23 (65.2%)
Residual PD signals	22/78 (28.2%)	8/32 (25.0%)	10/31 (32.3%)	4/15 (26.7%)
DAS28-ESR remission				
Achieved	57/94 (68.7%)	21/34 (72.4%)	26/37 (78.8%)	10/23 (47.6%)
Residual PD signals	16/57 (28.1%)	5/21 (23.8%)	9/26 (34.6%)	2/10 (20.0%)
CDAI remission				
Achieved	59/94 (62.8%)	26/34 (76.5%)	23/37 (62.2%)	10/23 (43.5%)
Residual PD signals	13/59 (22.0%)	5/26 (19.2%)	7/23 (30.4%)	1/10 (10.0%)
Boolean remission				
Achieved	46/94 (48.9%)	21/34 (61.8%)	17/37 (45.9%)	8/23 (34.8%)
Residual PD signals	10/46 (21.7%)	5/21 (23.8%)	4/17 (23.5%)	1/8 (12.5%)

*TNF inhibitors (Infliximab (n=6), Etanercept (n=14), Adalimumab (n=7), Golimumab (n=4), Certolizumab pegol (n=3)). ** Residual PD signals: patients who had any PD signals in asessed joints. ***Achieved: remission rate in biologics treated patients who were maintained normal CRP for a half year.

Conclusions: The patients who achieved clinical remission had residual PD signals. Patients with Tocilizumab induced remission had more residual PD signals compared with TNF inhibitor or Abatacept induced remission. More strict criteria of clinical remission may reduce residual PD signals in patients treated by Tocilizumab.

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SAT0084 CHARACTERISTICS OF PATIENTS WHO RESPOND POORLY TO REDUCTION OF BIOLOGICAL DISEASE-MODIFYING ANTI-RHEUMATIC DRUGS IN RHEUMATOID ARTHRITIS; RT-4 STUDY POST HOC ANALYSIS

Y. Urata[1], S. Abe[2], B. Devers[2], Y. Nakamura[3], H. Takemoto[4], K.-I. Furukawa[5]. *[1]Department of Rheumatology, Tsugaru General Hospital, Gosyogawara; [2]Marketing Department, Diagnostics Division, Sekisui Medical Co., Ltd., Tokyo; [3]Department of Orthopedic Surgery; [4]Department of Dermatology, Tsugaru General Hospital, Gosyogawara; [5]Department of Pharmacology, Hirosaki University Graduate School of Medicine, Hirosaki, Japan*

Background: A number of studies have shown that reduction of biological disease-modifying anti-rheumatic drugs (bDMARDs) is possible for rheumatoid arthritis (RA) patients in whom bDMARD treatment has induced clinical remission or low disease activity. However, there have been few studies which have evaluated the background characteristics of patients who have difficulty in reducing bDMARDs despite being in clinical remission or having low disease activity.
Objectives: To clarify the characteristics of RA patients who have difficulty with bDMARD reduction despite maintaining clinical remission in the rT-4 study.
Methods: This study is a post-hoc analysis of the rT-4 study. Briefly introducing the rT-4 study: 209 RA patients demonstrating both SDAI remission and MMP-3 normalization using bDMARDs for $\geq$3months were randomly allocated to one of four strategy groups: Standard care (SC group; n=50); SDAI-driven therapy (n=53); MMP-3-driven therapy (n=55); or both SDAI and MMP-3-driven therapy group (Twin; T group; n=51). Dose reduction methodology (every 3 months): ettanercept (ETN) - period between injections increased by one week; tocilizumab (TCZ) - dose reduced by 80mg or period between injections increased by one week; up to a minimum dose of: ETN - 25 mg every 5 weeks; TCZ - 80 mg every 5 weeks or 162 mg every 5 weeks. The dose was reverted to the previous level in the event that the target scores were exceeded, and the lower dose was eventually reattempted after the target was re-achieved. The primary outcome was the difference in the proportion of patients who maintained remission at 12 months among the four groups, compared against a non-inferiority margin of 10%. The results of the rT-4 study revealed that a twin target strategy can achieve effects non-inferior to standard care with regard to maintaining clinical remission. Specifically, subgroup analysis was carried out between the T and SC groups of the rT-4 study. A factor was defined as significant when the difference in the proportion of patients who maintained remission at 12 months in the two groups across subgroups, exceeded 10%.
Results: The requisite margin was recognized only for rheumatoid factor (RF) negativity (35.2%; 95% CIs of 14.4 to 65.0). Others factor were not identified.
Disease activity is likely to be affected by even a small dose reduction of bDMRADS in RA patients who are RF negative, regardless of the presence or absence of anti-citrulline antibody, and it can probably be explained as a nocebo effect. Nocebo effects occur in studies which investigate the effectiveness of drug reduction, and we believe that the nocebo effect is prone to happen in RF-negative patients.
Conclusions: The twin target strategy can be used to reduce the dose of bDMARDs for RA patients while maintaining the effectiveness of said bDMARDs, with the exception of RF negative patients.

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SAT0085 A STUDY ON CHARACTERISTICS OF RHEUMATOID ARTHRITIS PATIENTS ACHIEVING DEPRESSION REMISSION WITH 6 MONTHS OF BIOLOGIC AGENT TREATMENT

Y. Miwa[1], N. Yajima[1], T. Isozaki[1], R. Takahashi[1], Y. Miura[1], Y. Ikari[1], M. Hatano[1], T. Hayashi[1], T. Kasama[1], K. Sanada[2] on behalf of ASHURA Registry Group. *[1]Division of Rheumatology, Department of Medicine; [2]Department of Psychiatry, Showa University School of Medicine, Tokyo, Japan*

Background: Approximately 15% of RA patients also suffer from depression, with an odds ratio of 1.42 (95% CI 1.3 - 1.5) compared with healthy people. A previous study reported that biological agents can improve the depressed state associated with RA. Although previous studies have been cross-sectional, there were no reports that analyzed factors that led to depression remission.
Objectives: To examine the relationship between baseline factors and depression remission after six-month biologic agent treatment in rheumatoid arthritis (RA) patients.
Methods: The subjects were 384 RA patients treated with biologic agents. The following patient’s characteristics were investigated: age, gender, number of previous drugs, disease duration, type of biologic agents, baseline steroid dosage, methotrexate dosage and serum matrix metalloproteinase-3 (MMP-3) levels. For evaluation, we used the Simplified Disease Activity Index for RA disease activity; the Health Assessment Questionnaire Disability Index (HAQ-DI) score for activities of daily living; the Short Form-36 for nonspecific health-related quality of life; and Hamilton Depression Rating Scale (HAM-D) scores for depression status. Depression remission was defined by HAM-D$\leq$7 after 6 months of treatment. The subjects were divided into two groups according to the presence or absence of depression, and a retrospective study was performed.
Results: We included 152 patients in the analysis. Two hundred thirty-two

patients were excluded due to primary and secondary failure, complications, loss to 6-month follow-up, incomplete data, etc. Compared with a group of RA patients with depression remission (n=124), a group of patients with no depression remission (n=28) had a younger age (p=0.000), female sex (p=0.039), lower serum MMP-3 levels (p=0.021), lower HAQ-DI (p=0.018), lower HAM-D score (p=0.000), and higher Role/Social component summary score of the SF-36 (p=0.009) by univariate analyses. The binominal logistic analyses findings were as follows: younger age (p=0.0045, odd ratio: 0.94, 95% CI: 0.8–0.98), female sex (p=0.021, odd ratio: 0.21, 95% CI: 0.054–0.79), and lower HAM-D scores (p=0.0073, odd ratio: 0.85, 95% CI: 0.76–0.96).

Conclusions: It was suggested that RA patients who are female, younger in age and have lower depression scores at baseline are more likely to achieve depression remission status with the biologic treatment.

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SAT0086 THE ASSOCIATION BETWEEN ELDERLY RHEUMATOID ARTHRITIS PATIENTS USING BIOLOGICS AND ADVERSE EVENTS: RETROSPECTIVE COHORT STUDY

Y. Ikari, Y. Miwa, N. Yajima. *Division of Rheumatology, Department of Medicine, Showa University School of Medicine, Hatanodai Shinagawaku Tokyo, Japan*

Background: In Japan, the definition of the elderly was suggested as being over 75 years old by the Japan Geriatric Society. The effectiveness of biologics in elderly rheumatoid arthritis (RA) patients has been demonstrated in several clinical trials and cohort studies[1]. On the other hand, regarding safety, there are reports that the use of biologics in elderly RA patients is a significant risk for severe infections and that they do not increase the risk of serious infection [2,3]. There is little evidence to support the association between age of RA patients and adverse events caused by biologics.

Objectives: We aimed to examine whether the age of RA patients was associated with adverse events caused by biologics.

Methods: RA patients using biologics were eligible. The participants were collected at Showa University Hospital, Showa University Northern Yokohama Hospital and Showa University Koto Toyosu Hospital from 2005 to 2016 in a retrospective cohort study.

RA patients of 75 years and above compared with RA patients under 75 years.

The primary outcome was the rate of discontinuation due to adverse events caused by biologics. Statistical analysis was Pearson's chi-square test. Multivariable analysis was performed by multi linear analysis. Covariates were sex, glucocorticoids dose, csDMARDs, interstitial pneumonia, diabetes mellitus and chronic kidney disease.

Results: In total, 309 patients were enrolled. The mean age standard deviation was 57.1±15.6years, and 83.4% were women. 174 (56.3%) took glucocorticoid, and the mean glucocorticoid dose was 3.13±3.9mg.The patients over 75 years were 42 patients (13.6%), and those under 75 years were 267 patients (86.4%). The rate of discontinuation due to adverse events caused by biologics was 11/42 (26.2%) in the patients over 75 years and over, and 21/267 (7.9%) in the patients under the age of 75 (Relative Risk 1.24; 95% Confidential Interval (CI) 1.04 to 1.50; P 0.0003). Adverse events were bacterial pneumonia, pneumocystis pneumonia, exacerbation of interstitial pneumonia, urinary tract infection, herpes zoster, cytopenia, eruption, congestive heart failure. In the multivariable analysis adjusting for confounders, the rate of discontinuation in the group aged 75 years and older was significantly higher than that in the group under the age of 75 (regression coefficient 1.35; 95% CI 0.39–2.31; p=0.006).

Conclusions: Our results demonstrated that the rate of discontinuation due to adverse events by biologics was high significantly in RA patients over 75 years and above.

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SAT0087 THE RELEVANCE OF POOR PROGNOSTIC FACTORS FOR ACHIEVING LOW DISEASE ACTIVITY IN PATIENTS WITH RHEUMATOID ARTHRITIS: A COLLABORATIVE ANALYSIS OF THREE GERMAN COHORTS

Y. Meissner[1], K. Albrecht[1], A. Richter[1], L. Baganz[1], D. Huscher[1], M. Schneider[2], A. Strangfeld[1], A. Zink[1,3]. *[1]German Rheumatism Research Center, Berlin; [2]Heinrich-Heine University, Duesseldorf; [3]Charité University Medicine, Berlin, Germany*

Background: Poor prognostic factors (PPF) are used as decision-criteria for treatment strategies in patients with rheumatoid arthritis (RA). However, their definition is based on the outcome of rapid radiologic progression.

Objectives: To investigate the impact of PPF in RA on achieving low disease activity (LDA) at follow-up.

Methods: We performed a collaborative analysis of three large German RA cohorts. Patients under routine care were either DMARD-naïve (n=991, early arthritis cohort CAPEA), on 1st conventional synthetic (cs)DMARD (n=2,547, National Database of the German Arthritis Centres (NDB)), or switching to a 2nd (n=1,959) or a 3rd DMARD (n=1,854, both biologics register RABBIT). Disease activity based on DAS28, autoantibody positivity (RF+/ACPA+), erosions, disability (HAQ≥1.2) and intake of glucocorticoids (>5mg/d) were evaluated as PPF at baseline. The outcome was DAS28 at 0, 3, 6 and 12 months. With multinomial logistic regression analyses, predictors of either LDA (DAS28<3.2) at 12 months or treatment escalation (adding or switching to cs/biologic (b)DMARD) were investigated.

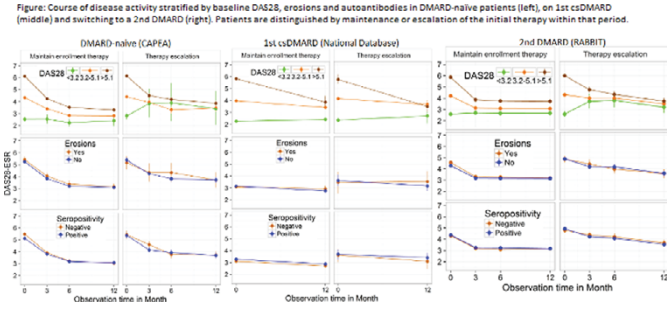
Results: Patients had a mean age of 57 to 60 years; 63% of DMARD-naïve patients and 71–72% of all others were female. Disease duration was 13 weeks in early RA (CAPEA) and 5–8 years in other cohorts. Patients with more treatment failures had more often PPF (not shown).

The figure shows the course of disease activity stratified by baseline DAS28, erosions and RF/ACPA. Values of DAS28 at baseline did not differ depending on presence/absence of erosions and autoantibodies. In all cohorts, irrespective of maintaining or escalating the initial treatment, patients with or without erosions and autoantibodies had similar DAS28 outcomes, whereas patients with moderate or high baseline DAS28 had higher disease activity during follow-up. The proportion of patients that did not achieve LDA at 12 months was 46% in DMARD-naïve, 34% on 1st DMARD, 47% switching to 2nd and 49% switching to 3rd DMARD.

In the multinomial model, a 1-unit increase in DAS28 was associated with a decreased probability to achieve LDA in all cohorts (table). In contrast, autoantibodies (OR from 0.8 to 1.3) and erosions (OR from 0.8 to 1.6) had no impact on achieving LDA at month 12 or on treatment escalation. The latter applied for DAS28 (OR from 0.9 to 1.5) and HAQ (OR from 0.7 to 1.2) regarding only treatment escalation.

Table 1. Selected OR (95% CI) of multinomial logistic regression

	DMARD-naïve	1st DMARD	2nd DMARD	3rd DMARD
Predictiors of LDA				
Age (by 5 yrs)	0.96 (0.9–1.0)	0.9 (0.8–0.99)	0.95 (0.91–0.99)	0.96 (0.9–1.0)
DAS28 (per 1 unit)	0.8 (0.6–0.9)	0.6 (0.4–0.9)	0.7 (0.6–0.8)	0.6 (0.6–0.7)
HAQ ≥1.2	0.9 (0.6–1.3)	1.1 (0.6–1.9)	0.6 (0.5–0.8)	0.6 (0.4–0.7)
GC >5 mg/d	1.6 (1.2–2.3)	0.6 (0.3–1.3)	1.0 (0.8–1.3)	0.99 (0.8–1.3)
b vs. csDMARD	–	–	1.4 (1.0–1.9)	1.4 (1.0–1.8)
Predictors for treatment escalation				
Age (by 5 years)	0.9 (0.9–0.98)	0.8 (0.7–0.9)	0.9 (0.8–0.9)	0.9 (0.9–0.96)
GC >5 mg/d	1.3 (0.8–1.9)	4.2 (1.6–11.0)	1.5 (1.1–2.0)	1.5 (1.2–2.0)



Conclusions: Although autoantibodies and erosions were associated with treatment failure, their absence did not predict LDA. Instead, baseline disease activity, functional status and glucocorticoid use may be more useful to guide treatment strategies when LDA is the target.

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