Objectives: This study aimed to evaluate the implementation and achievement of T2T approach and explore their associated factors in Chinese RA cohort.

Methods: A comprehensive cross-sectional survey of rheumatologists and their RA patients was conducted in China. Data were collected during May-Aug 2019 via physician-completed patient record forms. 60 rheumatologists provided data on demographic, clinical characteristics, treatments, and T2T approach implementation for 600 RA patients. Two logistic regressions were used to evaluate factors associated with T2T approach implementation and T2T goal achievement, respectively. Patients with missing data were not included in the models.

Results: 600 patients were included in this study (48.8±11.7 years, 70.3% female). 39.0% (N=234) of 600 patients were being treated with T2T approach, and 64.9% (N=366) of 564 patients had achieved T2T goal. Patients with longer disease duration (>2 years diagnosis) (odds ratio (OR) [95%CI]=1.61 [1.05, 2.49], vs. diagnosis ≤2 years), higher pain score (OR [95%CI]=1.26 [1.04, 1.51]), or receiving advanced therapy (OR [95%CI]=6.91 [3.64, 13.13]) were more likely to use T2T. Patients with BMI >23.9kg/m² (OR [95%CI]=2.83 [1.59, 5.04], vs. BMI≤23.9kg/m²), or who worked full-time (OR [95%CI]=2.12 [1.26, 3.57]) were more likely to achieve T2T goal, while patients with more pain (OR [95%CI]=0.77 [0.64, 0.92]) were less likely to achieve T2T goal.

Conclusion: Low implementation of T2T approach is observed in Chinese RA treatment. Longer disease duration, more pain, and receiving advanced therapy are associated with higher probability of T2T use, while higher BMI, full-time work and less pain are associated with higher probability of T2T goal achievement. Standard diagnosis and treatment according to guidelines may improve T2T approach implementation.

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AB0222

COMPARISON OF SELF-INJECTION DEVICES FOR ADMINISTERING ANTI-TUMOR NECROSIS FACTOR AGENTS USING THE ORIGINAL QUESTIONNAIRE IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Self-injection of biological agents has become a general practice in the treatment of rheumatoid arthritis (RA). Self-injectable biological agents differ in shape, needle thickness, drug fluid volume, and so on. These differences may affect patients' evaluations of self-injection devices. Five kinds of anti-tumor necrosis factor (TNF) agents can be administered by self-injection in clinical practice in Japan. Information on patients' evaluations of self-injection devices is important in choosing the agent for the treatment of RA among several agents with the same mechanism of action.

Objectives: The aim of this retrospective cross-sectional study was to compare patient evaluations of anti-TNF self-injection devices in the treatment of RA.

Methods: RA patients in whom etanercept (ETN) pen 50mg (Emlrel Pen) was switched to ETN biosimilar (BS) 50mg (ETN-BS [MA]), adalimumab (ADA) syringe 40mg (Humira syringe) was switched to ADA pen 40mg (Humira pen), golimumab (GLM) syringe 50mg (Simponi syringe) was switched to GLM auto-injector (Simponi AI), and certolizumab pegol (CZP) syringe (Cimzia syringe) was switched to CZP autoclicks (Cimzia AC) were asked to answer an originally developed questionnaire (Toyohashi Self-injection Assessment Questionnaire [T-SAQ]; Table 1) before and after switching agents. T-SAQ included 18 questions. A score of 0 indicated "best" and 4 indicated "worst" for each question, with a highest possible score of 72. The patients' characteristics and T-SAQ scores before and after switching agents were investigated. A statistical analysis of the difference in T-SAQ score between before and after switching was performed using the Wilcoxon signed-rank test. A P value < 0.05 was considered significant.

Results: The patients were divided into groups according to the agents they received with switching as follows: switchers from ETN pen to ETN-BS, n = 32; switchers from ADA syringe to ADA pen, n = 28; switchers from GLM syringe to GLM-AI, n = 25; and switchers from CZP syringe to CZP-AC, n = 10. The total T-SAQ scores were as follows, respectively: ETN pen and ETN-BS, 23.5 and 19.0; ADA syringe and ADA pen, 25.8 and 14.9; GLM syringe and GLM-AI, 23.8 and 17.4; and CZP syringe and CZP-AC, 30.6 and 18.8. The total T-SAQ was significantly improved after switching to the pen devices in all the switching groups. In the switchers from ETN pen to ETN-BS, the scores for questions 5, 10, 11, 12, 16, 17, and 18 were significantly improved after switching. The total T-SAQ scores were significantly improved for questions 1, 2, 3, 4, 5, 7, 11, 12, 13, 15, 16, and 17

in the switchers from ADA syringe to ADA pen, for questions 1, 2, 5, 7, 10, 16, and 17 in the switchers from GLM syringe to GLM-AI, and for questions of 1, 2, 3, 4, 5, 7, 11, and 15 in the switchers from CZP syringe to GLM-AI.

Conclusion: The pen devices were favorably assessed by the RA patients in whom syringe devices were switched to pen devices for the same agent. The total T-SAQ score improved in the RA patients in whom ETN pen was switched to ETN-BS probably because the thickness of the needle was thinner in the ETN-BS than in the ETN pen. The total T-SAQ score for the ADA pen was lowest probably because the thinnest needle was used (29 gauge) and the amount of drug fluid is smallest (0.4ml). The total T-SAQ score for the CZP syringe was the lowest probably because the thickest needle was used (25 gauge).

Table 1. Toyohashi Self-injection Assessment Questionnaire (T-SAQ)

Q	Score	0	1	2	3	4
1	Ease to use	Excellent	Very Good	Fair	Poor	Unacceptable
2	Ease of learning how to use	Very easy	easy	Fair	Difficult	Very Difficult
3	Ease of abandoning	Very easy	easy	Fair	Difficult	Very Difficult
4	Ease of injection	Very easy	easy	Fair	Difficult	Very Difficult
5	Ease of holding the device	Excellent	Very Good	Fair	Poor	Unacceptable
6	Occurrence of injection fluid leak	Never	Almost not	Fair	Sometimes	Always
7	Time of injection	Very short	Short	Fair	Long	Very Long
8	Burden on leisure or travel	Very small	Small	Fair	Big	Very big
9	Burden on household affairs or child-rearing	Very small	Small	Fair	Big	Very big
10	Burden on work (only for those working)	Very small	Small	Fair	Big	Very big
11	Strain or anxiety from injection	Very small	Small	Fair	Big	Very big
12	Strain or anxiety from needle	Very small	Small	Fair	Big	Very big
13	Disgust with or anxiety from self-injection	Very small	Small	Fair	Big	Very big
14	Needlestick accident	Never	Almost not	Sometimes	Often	Always
15	External appearance	Excellent	Very Good	Fair	Poor	Unacceptable
16	Pain from pricking with the needle	None	Very mild	Moderate	Severe	Very severe
17	Pain during drug injection	None	Very mild	Moderate	Severe	Very severe
18	Pain after injection	None	Very mild	Moderate	Severe	Very severe

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AB0223

MODIFIED DOSE RITUXIMAB BIOSIMILAR IN RHEUMATOID ARTHRITIS COMPARING B-CELL DEPLETION EFFECT AND DISEASE ACTIVITY SCORES

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Background: In emerging economies self-funding patients opt for less costly options, influencing both compliance and maintenance of treatment for chronic illness. Studies comparing originator rituximab 1000mgx2 and 500mgx2 doses in Rheumatoid arthritis (RA) have yielded interesting results¹. Evidence of B cell depletion, measured by CD19 count, maybe a marker for disease improvement². However effect of different dose of biosimilar Rituximab (bRTX) on B cell depletion and disease activity needs exploration.

Objectives: To determine correlation of CD19 count defining B cell depletion and disease activity with different dosages of bRTX treatment.

Methods: Between April 2019 and March 2020, all RA patients with DMARD failure were screened for eligibility of biologics as routine clinical practice. Depending on individual choice, after full consent, patients received either 1000mgx2 or 500mgx2 bRTX. All patients had CD19 count before and 12 months after the first dose. Effectiveness of bRTX 1000 mgx2 and 500 mgx2 was assessed by DAS28 and EULAR response. Comparative adjusted analysis was performed by analysis of variance (ANOVA).

Results: Out of 468 eligible patient, 84 opted for biologic. Of which 27 patients consented for bRTX (17 female, mean age 39.5 years).13 patients opted for 1000mgx2 and 14 for 500mgx2 dose. 74% (20/27) patients were on concomitant methotrexate and 26% on hydroxychloroquine (7/27). Both doses led to significant reduction in ESR, CRP, and DAS28-ESR at 12 months (p<0.001) (Table 1).

Table 1. RA outcome-measurement scores at 12 months post biosimilar Rituximab therapy.

Variable	Baseline		12 months	
	RTX 1000mg x 2(n=13)	RTX 500mg x 2(n=14)	RTX 1000mg x 2(n=13)	RTX 500mg x 2(n=14)
ESR*	53.9±23.9	57.1±24.7	23.9±2.9	24.1±4.7
CRP*	6.1±3.9	6.9±2.9	2.1±0.9	2.3±0.9
DAS28-ESR*	6.1±0.3	6.1±0.2	4.0±0.4	4.1±0.2
CD 19+ Count* [#] (10 ⁹ /L)	1191.6±308.4	1155±289.6	128.8±90.4	139±90.6

* p<0.0001 as compared to 12 mos vs baseline; [#] p<0.0001 as compared amongst group

At the end of 12 months, compared to 1000mg, CD19 count was higher in 500mg group ($p=0.25$). Percentage of patients achieving EULAR moderate or no response was higher in 500mg group (37%vs29%, $p=0.205$), both complete and incomplete B cell depletion, but patients achieving good response was same in both groups (14.8%vs18.5%, $p = 0.25$). (Figure 1).

Figure 1. EULAR Response at 12 months

Conclusion: Low dose bRTX is effective in DMARD refractory RA patients with similar improvements as regular dose, although CD19 depletion was less in low dose group. A larger study to establish radiographic regression with CD19 depletion and disease activity score can help in further strengthening the use of lower dose bRTX in RA leading to significant economic advantage.

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AB0224

SUSTAINABLE LOW DISEASE ACTIVITY IN PATIENTS WITH RHEUMATOID ARTHRITIS: REAL-WORLD EXPERIENCE WITH TOCILIZUMAB

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Background: Sustainability, the ability of drugs to maintain remission or low disease activity (LDA) in patients with rheumatoid arthritis (RA), plays a crucial role for the prevention of structural damage to joints and thus, preserving patients' functional capacity, health-related quality of life and general sense of well-being. Therefore, studying the sustainable effectiveness of tocilizumab (TCZ) as a monotherapy or combined with methotrexate (MTX) is important (1).

Objectives: We aimed to examine to what extend TCZ, alone or combined with MTX, could achieve and further sustain LDA in patients with long-standing RA in the light of current, strictly index-based definitions of LDA and to compare the two versions of DAS28 in patients in real clinical practice

Methods: 85 RA patients treated with TCZ for at least eighteen months were consecutively enrolled in the present single-center, retrospective cohort study. All participants met the 1987 ACR classification criteria and attended the rheumatology department of University Hospital "St. Marina" Varna in an outpatient setting. Patients receiving pre-filled syringe contained 162mg TCZ once weekly subcutaneously. Real-world data were extracted and analyzed from patient's full medical file. For each visit, disease activity score 28 with ESR and CRP (DAS28-ESR and DAS28-CRP) and simple disease activity index (SDAI) were calculated simultaneously according to generally adopted formulas. A twelve-month result was determined for sustained LDA at each of the patient's three visits (at 6-month intervals), according to DAS28 and SDAI. Descriptive statistics, Chi square test, Cochran's Q test, kappa statistic were used, a binary logistics model was compiled to study the impact. Significance level of $p < 0.05$.

Results: Two hundred fifty-five patient visits were analyzed. The mean durations of RA and treatment with TCZ were 12.6 (± 9.6) years and 3.64 (± 1.8) years, respectively. The mean age of patients was 60.3 years (37-87 years), 80% were women, 24.7% were obese, 65.9% have concomitant hypertension. 61.2% of patients are treated with combination therapy TCZ with MTX.

Of all patients, these with a sustained 12-month LDA were 41.2%, 28.2% or 23.5% depending on the studied index (DAS28-CRP, SDAI, or DAS28-ESR, respectively).

A 12-month SDAI LDA was found in a significantly small proportion of patients (28.2%, $p = 0.001$). The DAS28 ESR determined a proportion similar to SDAI (23.5%, $p > 0.05$), while according to the DAS28 CRP, patients with a sustained 12-month LDA were significantly more (41.2% $p = 0.005$). A moderate level of agreement was found between the assessments of SDAI and the two variants of DAC28 when determining 12-month results of Tocilizumab treatment (DAS28-ESR $k = 0.511$, $p < 0.001$ and DAC28-CRP $k = 0.618$, $p < 0.001$). No relationship was found between the combination of TCZ with MTX and the patients' chance of a sustained 12-month LDA, regardless of which index the result was measured. Patients with hypertension were significantly less likely to have sustained 12-month LDA according to SDAI and DAS 28 ESR (OR 0.135, 95% CI 0.048-0.386; OR 0.313, 95% CI 0.111-0.882, respectively), but not according to DAS28 CRP.

Conclusion: Sustained 12-month LDA with TCZ in patients with long-term RA remains uncommon in daily clinical practice. Co-administration of MTX is not associated with an increased likelihood of achieving a sustained LDA in the analysis of long-term responses. Patients with concomitant hypertension are less likely to be in a sustained 12-month LDA, according to SDAI and DAS28-ESR. The results according to DAS28 ESR, but not according to DAS28CRP are comparable to those of SDAI when measuring long-term results of treatment with TCZ.

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AB0225

TUMOR NECROSIS FACTOR ALPHA (TNF- α) INHIBITORS IN PATIENTS WITH REFRACTORY RHEUMATOID ARTHRITIS: REASONS FOR WITHDRAWAL

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Background: Refractory rheumatoid arthritis (RRA) is a subtype of rheumatoid arthritis (RA), in which the sequential administration of optimal methotrexate doses in combination with glucocorticoids, and at least - two biologic disease-modifying antirheumatic drugs (bDMARDs) with different mechanisms of action during 18-24 months does not lead to a significant decrease in the inflammatory activity of RA.

Objectives: to determine the reasons for the withdrawal of TNF- α inhibitors in patients with RRA.

Methods: The retrospective study included data of 95 RRA patients (80 females, 80.8%), aged 23 to 80 years (mean age 57 years), treated with TNF- α inhibitors. Mean RA duration was 11.9 $\pm$ 7.6 years. All patients were divided into 6 groups depending on the number of the lines of therapy received. A total of 154 cases of TNF- α were studied.

Results: Infliximab (INF) was most often prescribed as the first line of therapy - 40 prescriptions. The reasons for the withdrawal of INF as the first bDMARDs were: insufficient effectiveness (IE) - 20 cases (50% of appointments), administrative reasons (AdmR) - 13 cases (32.5% of appointments), adverse reactions (AR) - 6 cases (15% of appointments), remission - 1 case (2.5% of appointments). In the 2nd line of therapy, INF was prescribed in only 3 cases, the drug was canceled in all cases due to IE. In 3 lines of therapy, INF was prescribed in 4 cases, the reasons for withdrawal in these cases were IE (50%, 2 cases) and AR (50%, 2 cases).

Etanercept (ETC) was prescribed as the first line of therapy in 10 cases. The most common reason for withdrawal was IE in 5 cases (50% of appointments), AR - 4 cases (40%), AdmR - 1 case (10%). ETC was prescribed as a 2 line in 15 cases, the reasons for withdrawal then were: IE - 11 cases (73.3%), AR - 1 case (6.7%), AdmR - 3 cases (20%). ETC was prescribed as a 3-line therapy in 20 cases. The reasons for withdrawal were as follows: IE - 8 cases (40%), AR - 4 cases (20%), AdmR - 8 cases (40%). As a drug of 4 lines of therapy, ETC was prescribed 1 time and was canceled due to the development of AR. As the 5th line, ETC was appointed in 1 case and was canceled due to IE. ETC was assigned as line 6 in 1 case. The reason for the withdrawal was AR.

Adalimumab (ADA) was prescribed as the first line of therapy in 19 cases, the reasons for withdrawal were: IE - 14 cases (73.7%), AR - 2 cases (10.5%), AdmR - 3 (15.8%). On line 2, ADA made 20 appointments, the reasons for withdrawal were: IE - 13 (65%), AR - 3 (15%), AdmR - 4 (20%). ADA was prescribed as