drugs². Clinicians could then cycle through more of these expensive drugs because of inefficacy. As a modifiable risk factor smoking should be targeted to improve outcomes for patients.

Objectives: To complete a pilot study examining for an association between smoking and drug inefficacy in rheumatoid arthritis. This baseline data was used in a quality improvement project aimed at reducing the prevalence of smoking in our rheumatology patients.

Methods: We identified patients using a dataset and a database including all patients currently receiving biologics in Musgrave park hospital. Each patient had a diagnosis of rheumatoid arthritis and was being treated with a biologic. We randomly selected 100 patients with rheumatoid arthritis, 50 of whom were current smokers and 50 non-smokers. We then performed a search on Northern Ireland's electronic care record for each patient and identified how many DMARDs and biologics were discontinued due to inefficacy. Inefficacy was defined as ongoing synovitis despite receiving the drug at adequate dosage for 3–6 months resulting in the drug being discontinued. We also identified patients who received rituximab and the number of patients for which it was stopped due to inefficacy.

Results: DMARDs and inefficacy: non-smokers had on average 0.98 stopped and smokers had on average 2.2 stopped. Biologics and inefficacy: non-smokers had on average 0.5 stopped and smokers had on average 0.82 stopped. Twenty smokers and twenty non-smokers were treated with rituximab. Non-smokers: 4 out of 20 had rituximab discontinued due to inefficacy. Smokers: 8 out of 20 had rituximab discontinued due to inefficacy.

Conclusions: In this small sample of patients, we found that smokers had greater DMARD and biologic inefficacy, particularly with rituximab where smokers had double the rate of inefficacy compared to non-smokers. Our quality improvement project aims to reduce the prevalence of smoking in our rheumatology patients which could result in better disease control, reduction in cardiovascular risk, and less drugs being cycled through. Aiming to achieve this, steps have been taken to set up a rheumatology smoking cessation clinic in our health trust.

REFERENCES:

- [1] Saevardottir S, Rezaei H, Geborek P, Petersson I, Ernestam S, Albertsson K. Current smoking status is a strong predictor of radiographic progression in early rheumatoid arthritis: results from the SWEFOT trial. *Ann Rheum Dis* 2015;74(8):1509–14.
- [2] Chang K, Yang SM, Kim SH, Han KH, Park SJ, Shin JI. Smoking and rheumatoid arthritis. *Int J Mol Sci* 2014;15(12):22279–95.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.7345

THU0200 SUBCUTANEOUS TOCILIZUMAB IN PATIENTS WITH RHEUMATOID ARTHRITIS; A HIGH NUMBER OF PATIENTS ACHIEVE DOPPLER REMISSION AFTER 24 WEEKS

H.B. Hammer¹, I.M.J. Hansen², P. Jarvinen³, M. Leirisalo-Repo⁴, M. Ziegelsch⁵, B. Agular⁶, L. Terslev⁷. ¹Dept Of Rheumatology, Diakonhjemmet Hospital, Oslo, Norway; ²Dept of rheumatology, Svendborg Hospital, Svendborg, Denmark; ³Dept of rheumatology, Kiljavan Lääketutkimus, Kiljavan; ⁴Dept of rheumatology, Helsinki University Hospital and University, Helsinki, Finland; ⁵Dept of rheumatology, University Hospital, Linköping, Sweden; ⁶Med.dept, Roche; ⁷Centre for Rheumatology and Spinal Diseases, Copenhagen University Hospital at Glostrup, Copenhagen, Denmark

Background: Clinical remission in rheumatoid arthritis (RA) is evaluated by Composite Disease Activity Scores (CDAS) including DAS28 and CDAI. Ultrasound (US) is more sensitive than clinical examination for detection of synovitis and assessed by use of Grey Scale (GS) and vascularisation by power/colour Doppler.

Objectives: To explore the number of patients reaching Doppler compared to CDAS remission in moderate to severe biologically naïve RA patients (pts) treated with subcutaneous tocilizumab (TCZ-SC) over 24 weeks and to evaluate the safety of TCZ-SC.

Methods: A regional multi-country (Denmark, Finland, Norway, Sweden) open-label, single-arm study (part of TOZURA¹), enrolled pts with inadequate response to csDMARDs. Pts received TCZ-SC 162 mg qw for 24 weeks as monotherapy or in combination with a csDMARD. Stable oral NSAIDs and corticosteroids (CS) (≤ 10 mg/day prednisone or equivalent), were allowed. Clinical (tender and swollen joints), laboratory tests, safety assessments as well as US examination (36 joints and 4 tendons, scored according to the Norwegian US atlas²) were performed at baseline, 4, 12 and 24 weeks. US reliability between centres was assessed prior to the study. There is no consensus on definitions of Doppler remission, and Doppler sum scores of 0 to 3 were presently explored as definitions of US remission. CDAS and EULAR/ACR Boolean remission were calculated.

Results: 133 pts were included, and 110 pts were followed with US assessments (83% female, mean (SD) age 55.6 (12.1) years and RA duration 8.7 (9.5) years, 81% anti-CCP positive and 62% with erosive disease). All clinical, laboratory and US variables decreased significantly, already after 4 weeks ($p < 0.001$) (table 1). Table 2 illustrates the high percentages of patients reaching remission, especially for DAS28(ESR) and Doppler. Fourteen serious AE were reported in 12 pts and 15 AEs led to permanent withdrawal of treatment.

	Baseline Median (IQR) n=110	4 weeks Median (IQR) n=102	12 weeks Median (IQR) n=95	24 weeks Median (IQR) n=91
DAS28(ESR)	5.0 (4.3–5.8)	3.1 (2.1–3.8)	2.1 (1.5–2.9)	1.6 (1.1–2.4)
CDAI	23.8 (17.1–31.2)	12.9 (7.3–21.9)	7.2 (3.6–11.4)	4.3 (1.8–9.8)
CRP	5.5 (2.6–13.1)	0.2 (0.2–0.4)	0.2 (0.2–0.6)	0.2 (0.2–0.4)
ESR	21 (12–34)	4 (2–7)	3 (2–5)	3 (2–5)
Patient's global VAS (0–100)	55 (36–70)	32 (18–49)	16 (7–31)	12 (4–28)
Assessor's global VAS (0–100)	35 (25–49)	17 (11–31)	10 (5–18)	5 (2–11)
Tender joint count	8 (5–12)	4 (1–9)	2 (0–5)	1 (0–3)
Swollen joint count	6 (2–10)	2 (0.5–6)	1 (0–2.5)	0 (0–2)
Sum score GS	21 (13–36)	16 (8–30)	12 (5–21)	9 (3–19)
Sum score PD	8 (2–20)	4 (1–10)	1 (0–4)	0 (0–2)
Remission criteria	Percentages of Pts in remission at 12 weeks		Percentages of Pts in remission at 24 weeks	
CDAI	19.2		34.7	
DAS28(ESR)	64.6		83.5	
Boolean	14.0		27.4	
PD sum score=0	42.6		53.3	
PD sum score $\leq 1 \leq 2 \leq 3$	60.6/68.1/73.4		65.6/75.6/78.9	

Conclusions: This open label study showed TCZ-SC to significantly reduce inflammation assessed by both CDAS and Doppler US. A high number of pts (53%–79%) obtained Doppler remission at 24 weeks using the different definitions. The safety profile was similar to what has previously been reported.

REFERENCES:

- [1] EULAR 2017 Abstract SAT0199.
- [2] Hammer HB, et al. ARD 2011.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.3533

THU0201 A POOLED ANALYSIS OF THREE TNF- α INHIBITOR BIOSIMILAR STUDIES IN PATIENTS WITH RHEUMATOID ARTHRITIS COMPARING RADIOGRAPHIC PROGRESSION BY DISEASE ACTIVITY STATES

J.S. Smolen¹, M. Weinblatt², P. Emery³, E. Keystone⁴, M. Genovese⁵, G. Myung⁶, E. Hong⁶, I. Baek⁶, S. Lee⁶, J. Ghil⁶. ¹Medical University of Vienna, Vienna, Austria; ²Brigham and Women's Hospital, Boston, USA; ³Leeds Institute of Rheumatic and Musculoskeletal Medicine, Leeds, UK; ⁴Mount Sinai Hospital, Toronto, Canada; ⁵Stanford University Medical Center, Stanford, USA; ⁶Samsung Bioepis Co., Ltd., Incheon, Korea, Republic of Ireland

Background: SB4, SB2, and SB5 are biosimilars of the reference etanercept (ETN), infliximab (INF), and adalimumab (ADA), respectively. Radiographic progression using the modified Total Sharp Score (mTSS) at week 0 and final week (week 52 for etanercept and adalimumab and week 54 for infliximab) was measured in phase III randomised, double-blind studies comparing efficacy and safety of biosimilar to its reference product.

Objectives: Assess and compare radiographic progression by disease activity states at week 24 (for etanercept and adalimumab) or week 30 (for infliximab) in terms of DAS28 from a pooled analysis of three biosimilar studies.^{1–3}

Methods: Patients with radiographic data from each phase III study were pooled and grouped based on their disease activity state (remission, low disease activity [LDA], moderate disease activity [MDA], and high disease activity [HDA]) at week 24 or 30 in terms of DAS28. The mean change in mTSS and the proportion of radiographic non-progressors of higher disease activity groups (LDA, MDA, and HDA) in reference to remission were summarised descriptively and odds ratios (OR) were compared using 95% confidence interval (CI) obtained from logistic model with baseline DAS28.

Results: A total of 1263 patients from phase III studies had radiographic assessment available and the results are summarised in table 1.

Across all treatment groups, radiographic progression was the highest in HDA followed by MDA, LDA, and remission. In all treatments combined, the mean change in mTSS was 0.03, 0.38, 0.27, and 1.27 and the proportion of non-progressors was 79.7% (181/227), 78.1% (125/160), 74.1% (473/638), 58.4% (139/238) in remission, LDA, MDA, and HDA groups, respectively.

In all treatments combined, compared to remission group, the estimated difference in mTSS was greater in HDA (1.15, 95% CI: 0.63–1.66) than MDA (0.20, 95% CI: –0.22–0.62) and LDA (0.36, 95% CI: –0.20–0.91) groups and the OR of the proportion of the non-progressors was the smallest in HDA (OR 0.40, 95% CI: 0.26–0.61) followed by MDA (OR 0.76, 95% CI: 0.52–1.10) and LDA (OR 0.90, 95% CI: 0.55–1.49) (figure 1). This trend was similarly observed in other treatment groups.

Abstract THU0201 – Table 1. Summary of Change in Mean mTSS and a Proportion of Non-progressors

Treatment	Change in mTSS Mean±SD	Non-progressors n/n(%)
All Treatments Combined	0.43±2.78	918/1263 (72.7%)
Biosimilars Combined	0.33±2.40	523/702 (74.5%)
Reference Products Combined:	0.55±3.18	395/561 (70.4%)
SB4+ETN	0.59±2.94	324/477 (67.9%)
SB2+INF	0.38±2.83	313/422 (74.2%)
SB5+ADA	0.28±2.46	281/364 (77.2%)
SB4	0.45±2.50	174/249 (69.9%)
ETN	0.74±3.36	150/228 (65.8%)
SB2	0.38±2.15	157/213 (73.7%)
INF	0.37±3.39	156/209 (74.6%)
SB5	0.17±2.49	192/240 (80.0%)
ADA	0.50±2.40	89/124 (71.8%)

Figure 1. Odds Ratios of Non-progressors in Reference to Remission (vs. Remission)

Abstract THU0201 – Figure 1. Odds Ratios of Non-progressors in Reference to Remission (vs. Remission)

Conclusions: A pooled radiographic assessment data from three different biosimilar studies showed that radiographic progression was greater as disease activity worsened.

REFERENCES:

- [1] Emery, et al. *Rheumatology* 2017 Dec;56(12):2093–2101.
- [2] Smolen, et al. *Ann Rheum Dis* 2018 Feb;77(2):234–240.
- [3] Weinblatt, et al. *Arthritis Rheumatol* 2018 Jan;70(1):40–48.

Disclosure of Interest: J. Smolen Grant/research support from: AbbVie, Janssen, MSD, Pfizer, Roche, and UCB, Consultant for: AbbVie, Amgen, AstraZeneca, AstraZeneca, Celgene, GSK, Janssen, Lilly, Medimmune, MSD, Novartis-Sandoz, Novo Nordisk, Pfizer, Roche, Samsung Bioepis, Sanofi and UCB, M. Weinblatt Grant/research support from: Amgen, Bristol-Myers Squibb, Crescendo Bioscience, and Sanofi, Consultant for: AbbVie, Amgen, Novartis, Roche, GlaxoSmithKline, Merck, Samsung, Crescendo Bioscience, and AstraZeneca, and Bristol-Myers Squibb, Lilly, and Pfizer, P. Emery Consultant for: Pfizer, MSD, AbbVie, Bristol-Myers Squibb, UCB, Roche, Novartis, Samsung, Sandoz and Lilly, E. Keystone Consultant for: Abbott, AstraZeneca, Bristol-Myers Squibb, Crescendo Bioscience, F. Hoffmann-La Roche, Genentech, Janssen, Lilly, Merck, Pfizer, UCB, Samsung Bioepis, M. Genovese Consultant for: Samsung, Merck, AbbVie, Amgen, BI, J. Vencovsky Consultant for: Samsung Bioepis, Biogen, G. Myung Employee of: Samsung Bioepis, E. Hong: None declared, I. Baek Employee of: Samsung Bioepis, S. Lee Employee of: Samsung Bioepis, J. Ghil Employee of: Samsung Bioepis

DOI: 10.1136/annrheumdis-2018-eular.4382

THU0202

COMPARATIVE EFFECTIVENESS OF TOCILIZUMAB AS MONOTHERAPY VERSUS TNF INHIBITORS IN COMBINATION WITH CONVENTIONAL SYNTHETIC DISEASE MODIFYING ANTIRHEUMATIC DRUGS IN BIO-NAÏVE PATIENTS WITH RHEUMATOID ARTHRITIS

K. Lauper^{1,2}, T.K. Kvien³, C. Codreanu⁴, M.V. Hernández⁵, F. Iannone⁶, E. K. Kristianslund⁷, G. Lukina⁷, D.C. Nordström⁸, K. Pavelka⁹, Z. Rotar¹⁰, M. J. Santos¹¹, on behalf of Rheuma.pt, S.L. Gale¹², M. John¹³, Y. Luder¹³, D. S. Courvoisier¹, C. Gabay^{1,2}, ¹Rheumatology, University Hospitals of Geneva, Geneva; ²SCQM, Zürich, Switzerland; ³Diakonhjemmet Hospital, Oslo, Norway; ⁴Center of Rheumatic Diseases, University of Medicine and Pharmacy, Bucharest, Romania; ⁵Rheumatology, Hospital Clinic Barcelona, Barcelona, Spain; ⁶GISEA, University Hospital of Bari, Bari, Italy; ⁷ARBITER, Institute of Rheumatology, Moscow, Russian Federation; ⁸ROB-FIN Helsinki University Hospital and Helsinki University, Helsinki, Finland; ⁹Charles University, Prague, Czech Republic; ¹⁰BioRx.si, University Medical Centre Ljubljana, Ljubljana, Slovenia; ¹¹Rheumatology Department, Hospital Garcia de Orta, Almada, Portugal; ¹²Genentech, South San Francisco, CA, USA; ¹³F. Hoffmann-La Roche, Basel, Switzerland

Background: Tocilizumab (TCZ) as monotherapy was more efficacious than the TNF inhibitor (TNFi) adalimumab as monotherapy for treatment of rheumatoid arthritis (RA) patients refractory to methotrexate (MTX) or in whom MTX was deemed inappropriate (ADACTA study).¹ However, data are lacking regarding the comparative real life effectiveness of TCZ as monotherapy versus TNFi combined with conventional synthetic DMARDs (csDMARDs).

Objectives: To analyse treatment effectiveness by comparing drug retention rates and disease activity level in RA patients naïve to biological DMARDs (bDMARDs) treated with TCZ as monotherapy (TCZ mono) or TNFi combined with csDMARDs (TNFi combo).

Methods: We included patients with RA across 10 European registries (TOCERRA collaboration) who were naïve to bDMARDs and received treatment with either TCZ mono or TNFi combo from 2009 to 2016. Drug retention rate was analysed using a Kaplan–Meier model. The proportions of patients reaching CDAI low disease activity (LDA) and remission after one year were adjusted for attrition with the LUNDEX index.²

Results: A total of 6315 patients were eligible, 253 on TCZ mono and 6062 on TNFi combo. Patients with TCZ mono were younger, smoked less, and used less glucocorticoids at baseline compared with TNFi combo patients (table 1). The crude median retention was 2.8 years (95% CI: 2.0–3.3) and 2.0 years (95% CI: 1.8–2.1) for TCZ mono and TNFi combo, respectively (p=0.21). At 1 year, the rates of LUNDEX corrected CDAI LDA (CDAI ≤10) and remission (CDAI ≤2.8) were similar between both groups (figure 1). The results were unchanged when considering the type of combination with csDMARDs and the dosage of MTX.

Abstract THU0202 – Table 1. Baseline characteristics

	TCZmono (n=253)	TNFi combo (n=6062)	p
Age, yr (median [IQR])	54.7 [45.1; 62.6]	59.1 [48.0; 66.0]	<0.001
Female gender, n (%)	202 (80.2%)	4715 (77.8%)	0.42
Ever smoker, n (%)	23 (15.8%)	1254 (26.3%)	0.006
Disease duration, yr (median [IQR])	5.6 [2.1; 12.5]	5.4 [1.9; 11.4]	0.44
Seropositivity (RF and/or ACPA), n (%)	158 (80.2%)	4158 (81.5%)	0.72
Glucocorticoids, n (%)	56 (22.1%)	2932 (48.4%)	<0.001
GC dose mg/day	5.0 [5.0; 7.5]	5.0 [5.0; 10.0]	0.02
Concomitant csDMARD, n (%)			
MTX		3528 (58.2%)	
MTX+other csDMARDs		1377 (22.7%)	
Other csDMARDs than MTX		1157 (19.1%)	
Route of administration, n (%)			<0.001
Intravenous	154 (80.6%)	441 (13.3%)	
Subcutaneous	37 (19.4%)	2870 (86.7%)

Abstract THU0202 – Figure 1. Patients in LUNDEX corrected CDAI low disease activity (LDA) at 1 year