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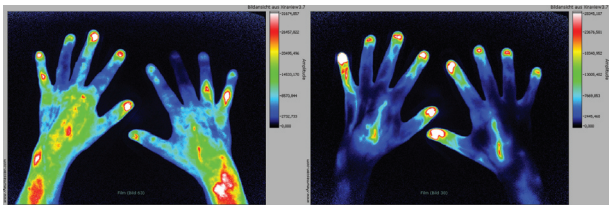

Figure 1. Decrease of ICG-enhancement in FOI, phase 1 (P1). Left image shows P1 of both hands at baseline (before CZP). Right image shows FOI in P1 of the same patient at w52 under CZP.

Legend: ICG: indocyanine green; FOI: fluorescence optical imaging; CZP: Certolizumab pegol; w52: week 52

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AB0397 PREDICTION OF RECURRENCE AFTER DISCONTINUATION OF ADALIMUMAB BY USING ULTRASOUND ASSESSMENT -THE PROUD STUDY-

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Background: Tapering of biological disease-modifying anti-rheumatic drugs (DMARDs) is recommended by European League Against Rheumatism (EULAR) in patients with stable rheumatoid arthritis (RA) disease activity. Discontinuation of biological DMARDs can be successful in some patients. However, the predictive factors enabling established patients with RA to remain free of biological DMARDs is unclear. Recently, ultrasonography (US) has become an important imaging tool to identify subclinical synovitis, even in patients with remission. There have been few reports on whether residual synovitis as shown by US can predict relapse of disease activity after discontinuation of biological DMARDs.

Objectives: We aimed to investigate the usefulness of US for predicting relapse in patients in remission for RA after discontinuation of adalimumab (ADA).

Methods: Patients who were using ADA and in remission (Disease Activity Score 28-joint count C reactive protein (DAS28-CRP) <2.6) for longer than 24 weeks were included in this multicenter prospective study. ADA was stopped and patients were followed up until week 52. Predictive factors for relapse at 24 and 52 weeks were analyzed from baseline clinical data, including a US examination. ADA was restarted at the time of relapse (DAS28-CRP $\geq$3.2). US assessment was performed at 0, 12, 24, 36, and 52 weeks and at the time of relapse. A US examination was performed at the bilateral first to fifth metacarpophalangeal joints, first interphalangeal and second to fifth proximal interphalangeal joints, and first to fifth metatarsophalangeal joints, by using a high-frequency linear transducer. The gray scale (GS) and power Doppler (PD) signals were scored in each synovial site using a semi-quantitative scale from 0 to 3. Moreover, the modified Total Sharp Score (mTSS) was evaluated at 0, 24, and 52 weeks by conventional radiography. The patients who relapsed were administrated ADA again.

Results: Fifty-three patients were included. Ten (18.9%) patients relapsed up to week 24 and 20 (37.7%) patients relapsed up to 52 weeks. The relapsed patients tended to have a long disease duration, but baseline US findings could not predict relapse. Increases in the PD score were observed during follow-up in some relapsed patients. Disease activity control was good after ADA was restarted in the relapsed group, and there was no difference in progression of the mTSS in the relapsed and non-relapsed groups.

Conclusion: Predicting relapse by baseline US findings after discontinuation of ADA in remission is difficult. However, an increased PD score in a following US examination might be useful for early detection of relapse. Radiographic progression is not significantly different in patients with relapse and those without relapse.

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AB0398 COMPARATIVE SAFETY OF ABATACEPT AND OTHER NON-TUMOR NECROSIS FACTOR INHIBITORS IN RHEUMATOID ARTHRITIS: A SYSTEMATIC LITERATURE REVIEW AND NETWORK META-ANALYSIS

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Background: Abatacept has shown equivalent efficacy with other targeted therapies in rheumatoid arthritis (RA) patients[1], and equivalent or, in some cases, superior safety compared with tumor necrosis factor inhibitors (TNFi)[2,3]. However, there is limited evidence of its safety profile relative to other non-TNFi.

Objectives: To evaluate the class-level safety profile of abatacept compared with other non-TNFi in adults with moderate-to-severe RA in phase 3 and 4 clinical trials.

Methods: A systematic literature review (SLR) of phase 3 and 4 randomized controlled trials (RCTs) of adults with RA was conducted. The non-TNFi included were abatacept, tocilizumab, sarilumab, tofacitinib, baricitinib and rituximab. A search from database inception until Febuary 2018 was performed on MEDLINE®, Embase, CENTRAL, and the US and EU clinical trials registries. Conference proceedings from ACR and EULAR from 2015 to end of 2017 were also reviewed. Patients who were cDMARD-naive or not receiving concommitant cDMARD treatment were excluded from the main analysis. In Bayesian network meta-analysis (NMA) random effects model, drug class-level comparisons were made with respect to the risk of total aggregated adverse events (AEs), serious AEs (SAEs), treatment-related AEs, infection, serious infection, and cancer.

Results: We identified 39 RCTs that met the eligibility criteria for this SLR. The risk of bias was found to be low as assessed by the Cochrane Collaboration's tool for assessing risk of bias in randomized trials. Eight studies investigated abatacept (T-cell inhibitor), with no head-to-head comparison to other non-TNFi. Other interventions evaluated were

IL-6 inhibitors (tocilizumab, n=13; sarilumab, n=3), JAK inhibitors (tofacitinib, n=7; baricitinib, n=4), and B-cell depleting agent (rituximab, n=4).
The pooled study population of 27,215 moderate-to-severe RA patients primarily consisted of middle-aged Caucasian females (mean age: 47-55 yrs;% Caucasian: 44% - 97%;% female: 69% - 88%). Thirty three trials were on patients previously treated with cDMARD or TNFi, while 6 trials were on cDMARD-naive patients. Total aggregated AEs (total AEs, n=37; SAEs, n = 37; treatment-related AEs, n = 14) and infection (serious infection, n = 35; total infection, n = 26) were the most frequently reported safety outcomes.
The NMA was performed on 23 trials. Indirect comparisons were made between IL-6 inhibitors, JAK inhibitors, B cell depleting agent and abatacept, with TNFi or cDMARD as direct comparators. The risk of total AEs was significantly higher for IL-6 inhibitors compared with abatacept (RR = 1.13, 95% CrI = 1.05 – 1.22). For SAEs and other analyzed safety outcomes, no significant difference was observed between abatacept and other non-TNFi drug classes. Similar results were observed in sensitivity analyses for all patients on concomitant cDMARD, including those who were treatment-naive before the study (n=26 trials).
Conclusion: When comparing aggregated safety outcomes, abatacept shared a similar safety profile with most non-TNFi RA treatments. However, patients on abatacept had a statistically significantly lower risk of total AEs compared to US recommended doses of IL-6 inhibitors. More studies with head-to-head comparison in clinical trials and real-world setting are required to provide further understanding of the safety profile and risk of specific adverse events for non-TNFi in order to optimize treatments for moderate-to-severe RA patients.

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AB0399 EVOLUTION OF BIOLOGIC/SMALL MOLECULE SWITCHING PATTERNS IN RA BETWEEN 2016 AND 2018

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Background: TNF therapy has been the standard of care for adult patients diagnosed with autoimmune conditions and are typically used as a first-line biologic/small molecule in the treatment of rheumatoid arthritis (RA). However, the adoption of systemic agents with alternate mechanisms of action (AMOA) such as JAK and interleukin inhibitors have increased in recent years across many indications. As such, the practice of sequential TNF prescribing following an initial TNF discontinuation is becoming less common, with switches to AMOAs, such as JAK and IL-6 inhibitors, becoming more popular.
Objectives: This research sought to track the evolution of biologic/small molecule switch patterns among US RA patients between 2016 and 2018 and to identify differentiating patient characteristics between the switch patterns.
Methods: An independent market analytics firm collaborated with US rheumatologists to conduct a retrospective chart review of RA patients who switched biologic/small molecule treatment 12 weeks prior to being surveyed. Physicians were able to submit up to 7 patient charts. Data were collected via a HIPAA-compliant online audit in January 2016 (n=198 rheumatologists/980 patient charts), in September 2017 (n=176 rheumatologists/1,002 patient charts), and September 2018 (211 rheumatologists/1,074 patient charts). Results were analyzed in SPSS.
Results: Analysis of patients recently switched from one biologic/small molecule to another revealed the decreasing popularity of cycling to another TNF after initial TNF discontinuation. TNF cycling accounted for 46% of all switches in 2016, 41% in 2017, and 40% in 2018. Conversely, switches from TNFs to JAK inhibitors accounted for 13% in 2016, 12% in 2017, and 15% in 2018. Switches to IL-6 inhibitors increased from 8% of all switches in 2016, to 9% in 2017, and 11% in 2018. The number of patients switched from a TNF to abatacept or rituximab remained stable over the study periods.
Patients who were cycled to another TNF were diagnosed with RA for a shorter amount of time, had been on a biologic for less time, had a lower swollen joint count and CRP level, were more likely to be males, were least likely to require a prior-authorization for treatment, and more likely to have been switched due to tolerability issues.
Consistent in all three years of data, patients switched to JAK inhibitors played a larger role in the switching decision, had a higher physician global assessment rating of global health, had a lower cardiovascular risk profile, were less likely to be prescribed concomitant methotrexate, and were more likely to participate in a manufacturer-sponsored co-pay assistance program.
Patients switched to an IL-6 inhibitor were largely indistinguishable from those undergoing other types of switches; however, they were slightly more likely to have more severe RA, have a slightly lower average physician global health assessment rating, were more likely to be obese, and have an elevated cardiovascular risk.
Conclusion: While the practice of TNF cycling is still the most predominant switch pattern among RA patients migrating from a first-to-second line biologic/small molecule therapy, the practice has been declining over the last three years. Over time, rheumatologists are increasingly likely to introduce a JAK or IL-6 inhibitor in the second-line setting following discontinuation of a first-line TNF.
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AB0400 FREQUENCY OF BIOLOGIC/SMALL MOLECULE MONOTHERAPY FOR RHEUMATOID ARTHRITIS IN THE EU: REAL-WORLD EVIDENCE FROM A PATIENT AUDIT STUDY

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Background: Biologic/small molecule therapy has been the standard of care for adult patients diagnosed with rheumatoid arthritis (RA) who have failed conventional DMARD therapy, resulting in familiarity, comfort, and satisfaction among physicians. Prior recommendations of combining biologics/small molecules with a DMARD like methotrexate (MTX) have recently been challenged by clinical data demonstrating the effectiveness of IL-6 and JAK inhibitors as monotherapy.
Objectives: This research sought to evaluate the frequency of biologic/small molecule monotherapy regimens among European RA patients who were recently switched from one biologic/small molecule to another.
Methods: An independent market analytics firm collaborated with rheumatologists in France (n=62), Germany (n=66), Italy (n=61), Spain (n=68) and the UK (63) to conduct an online retrospective chart review of RA patients who had switched treatment from one biologic/small molecule to another in the prior twelve weeks. Rheumatologists were able to submit up to seven RA patient charts. A total of 1,312 patient charts were collected via a market-specific compliant audit form in September 2018 and included patient and physician demographics, patient treatment history, and clinical/non-clinical patient parameters.
Results: Overall, the analysis of patient chart audits revealed that 22% of all recently switched patients were switched to a biologic/small molecule monotherapy regimen. The frequency of monotherapy was highest in Germany (32%) and lowest in the UK (13%). Monotherapy was more frequent for patients switched to infliximab (39%) and tofacitinib (39%) and lowest for those switched to tocilizumab IV (12%) and rituximab (11%). When combined into classes of agents, frequency of monotherapy among recently switched patients was 25% for TNFs, 24% for JAK inhibitors, 23% for IL-6 inhibitors, and 16% for non-JAK/IL-6 AMOAs (abatacept or rituximab).
On a country-specific level, rates of TNF monotherapy were highest in Germany (38%) and lowest in the UK (16%). IL-6 monotherapy was also more common in Germany (27%) but least common in France (17%). JAK monotherapy was highest in France (34%) and lowest in the UK (7%), while monotherapy for abatacept/rituximab was highest in Germany (32%) and again lowest in the UK (13%).
Conclusion: The popularity of biologic/small molecule monotherapy varies by EU5 country and while rates are highest for TNF inhibitors, use of biologic/small molecule monotherapy for patients recently switched to a JAK or IL-6 inhibitor are comparable.
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