SUPPLEMENTAL MATERIAL

Supplemental methods

Model specification

Bayesian network meta-analysis (BNMA) using individual patient-level data was used to perform mixed-treatment comparisons (combining direct and indirect comparisons). BNMA allows combination of the evidence from all relevant (direct and indirect) treatment comparisons in a single statistical model[1]:

$$y_{ijk} = \begin{cases} L\left(\mu_{ijk}, \sigma_i^2\right) & 0 \leq y_{ijk} \leq 100 \\ 0 & otherwise \end{cases}$$

$$\mu_{ijk} = \alpha_{ij} + \sum_{il} \beta_{il} x_{ijkl}$$

$$\alpha_{ij} = \alpha_j + \vartheta_{ij}$$

$$\left(\vartheta_{i1,}, \vartheta_{i2}, \ldots, \vartheta_{ij}\right) \sim MVN(0, \Sigma_j)$$

where y is the outcome, x the covariates, i indicates the study, j the treatment, k the patient and l the covariate.

To complete the model specification within the Bayesian framework, we assigned a uniform prior distribution HN(10) for the square root of the between-trial (τ^2) and within-trial (σ_{ij}^2) variance parameters. The prior distribution for the regression coefficients was N (0, 10^2).

Dougados M, *et al. RMD Open* 2022; 8:e002478. doi: 10.1136/rmdopen-2022-002478

The model specified above is a random-effects network meta-regression adjusting for participant-level effect modifiers. This model can be easily simplified in a fixed-effects model by removing the study specific ϑ_{ij}.

All analyses were implemented in R and Just Another Gibbs Sampler (JAGS) and were based on 4 chains. For each chain, we allowed 7000 adaptation samples and a burn-in period of 2000 samples to ensure that convergence was reached.

Inferences were based on posterior distribution (mean, median, 95% credible interval, posterior probability of a larger pain reduction). The summary treatment effects were calculated as d(tofacitinib-placebo), d(adalimumab-placebo) and d(tofacitinib-adalimumab) as well as the posterior probability of a larger pain reduction, p(d(tofacitinib-placebo)<0), p(d(adalimumab-placebo)<0), p(d(tofacitinib-adalimumab)<0).

Model selection

Departure from normality was observed in the primary endpoint; Patient's Assessment of Arthritis Pain at Month 3 (supplemental figure 1). Several parametric distributions were investigated: skew normal; truncated t (with 4 degrees of freedom); truncated Laplace; exponential; and gamma. The selection between different distributions was performed using the deviance information criterion (DIC) that combines a Bayesian measure of fit with a measure of model complexity, and based on providing clinically meaningful results. Models with smaller DIC are better supported by the data. One of the best-fitting models was achieved by assuming a truncated Laplace distribution of the primary endpoint: Patient's Assessment of Arthritis Pain at Month 3 (supplemental table 1).

Supplemental tables

Supplemental table 1 Deviance information criterion of the parametric distributions investigated for the Bayesian network meta-analysis fixed-effects model used for the primary endpoint: Patient's Assessment of Arthritis Pain at Month 3

Distribution	Deviance information criterion
Skew normal	14617.7
Truncated t	11699.5
Truncated Laplace	4913.9
Exponential	4770.1
Gamma	4412.4

Supplemental table 2 Proportion of patients with an abrogation of inflammation[a] after 3 months of therapy by indication and study

	Tofacitinib 5 mg BID	**Adalimumab 40 mg Q2W**	**Placebo**	**Total**
Pooled rheumatoid arthritis/psoriatic arthritis				
Full analysis population, N	2568	691	909	4168
Patients with abrogation of inflammation, N (%)	382 (14.9)	118 (17.1)	50 (5.5)	550 (13.2)
Rheumatoid arthritis				
Full analysis population, N	2330	585	673	3588
Patients with abrogation of inflammation, N (%)	328 (14.1)	87 (14.9)	20 (3.0)	435 (12.1)
ORAL Step (NCT00960440)				
Full analysis population, N	133	–	132	265
Patients with abrogation of inflammation, N (%)	17 (12.8)	–	0 (0.0)	17 (6.4)
ORAL Scan (NCT00847613)				
Full analysis population, N	316	–	156	472

Patients with abrogation of inflammation, N (%)	35 (11.1)	–	5 (3.2)	40 (8.5)
ORAL Solo (NCT00814307)				
Full analysis population, N	241	–	122	363
Patients with abrogation of inflammation, N (%)	30 (12.4)	–	8 (6.6)	38 (10.5)
ORAL Sync (NCT00856544)				
Full analysis population, N	312	–	158	470
Patients with abrogation of inflammation, N (%)	42 (13.5)	–	3 (1.9)	45 (9.6)
ORAL Standard (NCT00853385)				
Full analysis population, N	198	199	105	502
Patients with abrogation of inflammation, N (%)	19 (9.6)	12 (6.0)	4 (3.8)	35 (7.0)
ORAL Start (NCT01039688)				
Full analysis population, N	370	–	–	370
Patients with abrogation of inflammation, N (%)	62 (16.8)	–	–	62 (16.8)
ORAL Strategy (NCT02187055)				
Full analysis population, N	760	386	–	1146

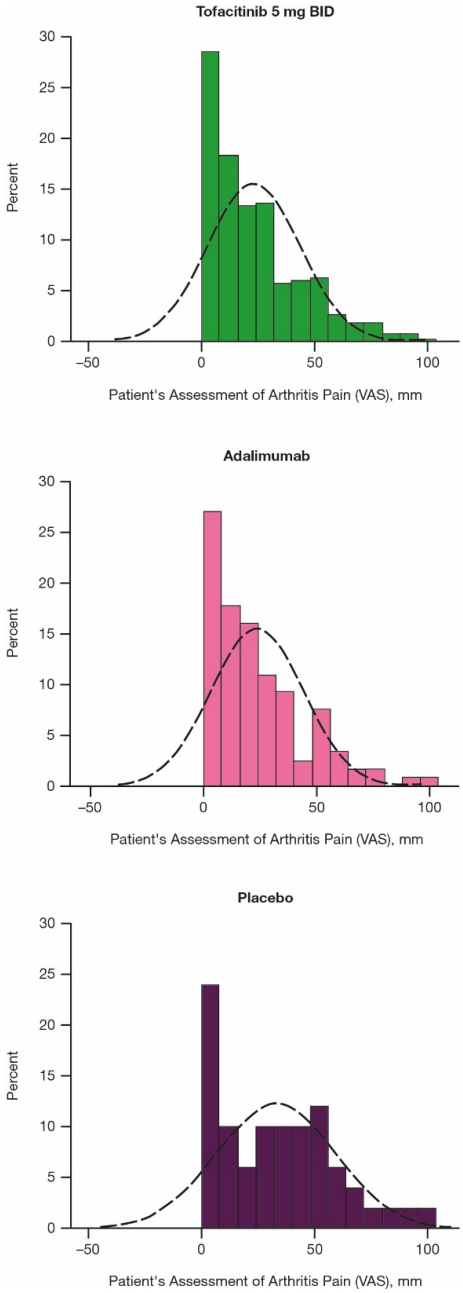
Patients with abrogation of inflammation, N (%)	123 (16.2)	75 (19.4)	–	198 (17.3)
Psoriatic arthritis				
Full analysis population, N	238	106	236	580
Patients with abrogation of inflammation, N (%)	54 (22.7)	31 (29.2)	30 (12.7)	115 (19.8)
OPAL Broaden (NCT01877668)				
Full analysis population, N	107	106	105	318
Patients with abrogation of inflammation, N (%)	23 (21.5)	31 (29.2)	13 (12.4)	67 (21.1)
OPAL Beyond (NCT01882439)				
Full analysis population, N	131	–	131	262
Patients with abrogation of inflammation, N (%)	31 (23.7)	–	17 (13.0)	48 (18.3)

[a]An abrogation of inflammation defined as SJC=0 and CRP <6 mg/L.

BID, twice weekly; CRP, C-reactive protein; N, number of patients; Q2W, once every 2 weeks; SJC, swollen joint count.

Supplemental figure

Supplemental figure 1 Distribution of the Patient's Assessment of Arthritis Pain at Month 3



Dashed line indicates a normal distribution.

BID, twice weekly; VAS, visual analogue scale

Supplemental reference

1 Zhang J, Carlin BP, Neaton JD, et al. Network meta-analysis of randomized clinical trials: reporting the proper summaries. *Clin Trials* 2014;11:246–62. doi:10.1177/1740774513498322.