Case Study

Data driven competitive landscape analysis to facilitate Go/No-Go decision in clinical development

About the Client

A Switzerland based large pharma company engaged in development of novel antibody therapeutics against Rheumatoid Arthritis (RA), was analysing the data to demonstrate the advantage of longitudinal meta-analysis over conventional meta-analysis that uses end-of-study (EOS) data, toward facilitating more effective Model Informed Drug Development (MIDD) decisions.

Project Objective

The objective of the analysis was to determine the competitive position of their novel antibody in early clinical Phase II B versus all the approved biologics against Rheumatoid Arthritis (RA). They were mainly interested in performing a quantitative assessment of the longitudinal time course of clinical efficacy that would enable informed decision making on further clinical development.

Client Requirement

The client approached Excelra to develop a Model Based Meta Analysis (MBMA)-ready dataset, by curating all the existing scientific evidence around the efficacy of marketed biologics for RA.

- The curated dataset should have summary time-course response on clinical outcomes used in late stage clinical trials.
- The data should also cover information about prior and concomitant medications including:
  - Respective category-wise percentage of patients (with response status to medications)
  - Baseline patient characteristics and sample size including N in statistical analysis

Indication Background – Rheumatoid Arthritis

RA is an auto-immune disease that leads to inflammation, progressive joint damage, and disability. Therapeutic options range from corticosteroids, nonsteroidal anti-inflammatory drugs, analgesics, traditional disease modifying antirheumatic drugs (DMARDs), and then biologics.

Besides the fact that clinical effects of a drug depend on patient characteristics and the nature of prior and concomitant therapies; the ‘speed of onset’ of drug effect is important in RA because of the availability of multiple therapeutic options. In this regard, biologics are usually employed as the therapeutic choice for refractory patients (to DMARDs).

The Excelra Approach

In line with the specified requirements, Excelra’s Clinical Pharmacology group used a robust scientific curation methodology coupled with systematic literature review (SLR), to synthesize data on existing therapeutics for performing model based meta-analysis (MBMA). The following steps were implemented:

- Defined project scope with PICOS methodology for conducting Systematic Literature Review in PubMed.
- Screened, labelled and developed a database for enabling further qualification and selection of relevant publications according to PICOS specifications.
- Additional references were identified following a thorough search across FDA drug labelling information and traditional meta-analysis publications (119 sources identified).

- A customized clinical outcomes database was developed, capturing:
  - Clinical outcomes summary data (Time vs Response)
  - Patient population details (Baseline characteristics, prior and concomitant therapy)
  - Interventions (Dose regimen)
  - Comparator (Dose regimen)
  - Study design (Sample size)
- A rigorous 3-level Quality Control (QC) process was employed for database development.

Table 1: Summary-level information about the studies included in the analysis

Drug name	No. of studies[1]	No. of patients[2]
Abatacept	4	951
Adalimumab	7	1403
Anakinra	1	250
Certolizumab	2	639
Etanercept	7	1021
Golimumab	3	401
Infliximab	5	994
Rituximab	4	683
Tocilitzumab	5	1525
Methotrexate	29	5287
Placebo	6	321

Notes:

1 No. of studies with the corresponding drug

2 No. of patients receiving an approved dose of the corresponding treatment

Project Outcomes

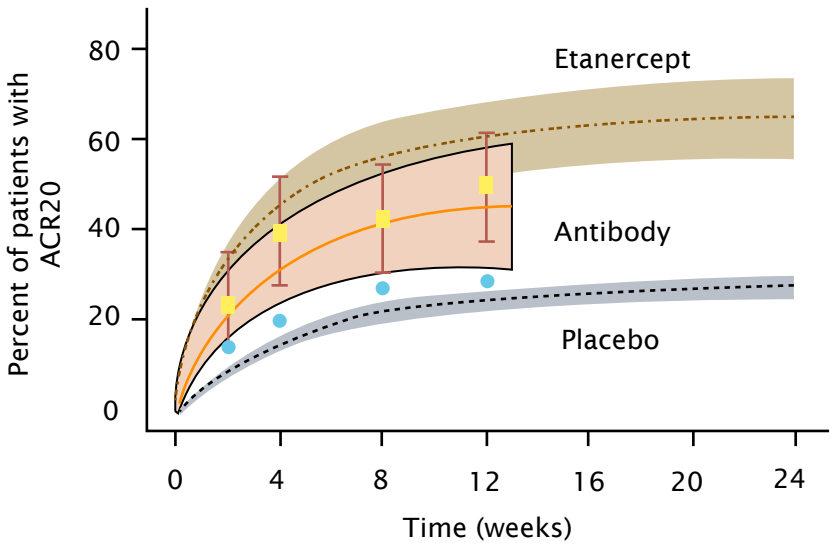
Excelra refined the in-house literature database (Clinical Trial outcomes Database) for Rheumatoid Arthritis, which included 37 Phase II & III studies describing 13474 patients, 75 arms, and 502 summary points.

The database was updated with each time-point, which was data-digitized from the illustrative time course curve from each study.

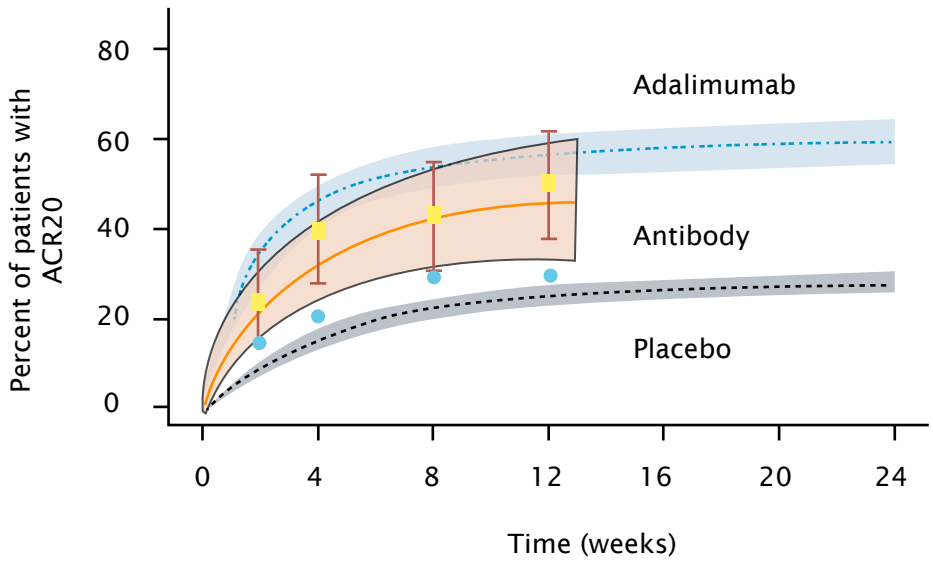
This enabled the client to compare the antibody of interest with the available biologics for Rheumatoid Arthritis.

The magnitude of response and the associated time course analysis from Excelra's databases showed that the novel antibody had lower chances of success owing to its inferior efficacy profile in RA (ACR20), when compared to competitor drugs, Etanercept and Adalimumab (as shown in figure below).

Antibody vs. Etanercept



Antibody vs. Adalimumab



Client Benefit

Based on the custom datasets developed by Excelra, the client was able to demonstrate the advantage of longitudinal data analysis over conventional EOS meta-analysis. Combining the resultant longitudinal MBMA on late stage clinical outcome ACR20, with inhouse Phase II B data of the novel antibody, helped the client to make a well-informed, data-driven 'No-Go' decision for further clinical development of the biologic against RA.

Excelra's Service Portfolio

	Insights	Data
Discovery	• Data Science Driven Drug Discovery • Target Identification • Target Dossier Services	• Chemistry Curation Services • GOSTAR Structure Activity Relationship database
Translational	• Biomarker Discovery • Drug Repositioning • Life Cycle Management • Systems Biology Informatics	• Biology Curation Services • GOBIOM Biomarker intelligence database
Clinical	• Precision Oncology Informatics • Clinical Pharmacology	• Clinical Trial Outcomes Database
Value Evidence	• Outcomes Research • Epidemiology Modelling • Economic Modelling • Value Evidence Communication	• RWE & Big Data Realization • SLR & Meta-analysis
Technology Solutions	• Enterprise Data Strategy • Enterprise Cloud Ops • Enterprise Digital Transformation	

For more information, visit https://www.excelra.com/clinical/#clinical_trial

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About Excelra

Excelra's data and analytics solutions empower innovation in life sciences across the value chain from discovery to market. The Excelra Edge comes from a seamless amalgamation of proprietary curated data assets, deep domain expertise and data science. The company's multifaceted teams harmonize and analyse large volumes of disparate unstructured data using cutting-edge technologies. We galvanize data-driven decisions to unlock operational efficiencies to accelerate drug discovery and development. Over the past 18 years, Excelra has been the preferred data and analytics partner to over 90 global clients, including 15 of the top 20 large Pharma.

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