

First line treatment with conventional synthetic Disease Modifying Antirheumatic Drugs in Rheumatoid Arthritis: a multinational population-based cohort from 14 real world healthcare databases and 9 countries - reality versus guidelines

Anthony G. Sena^{1,2,3}, Denis Granados⁴, Nigel Hughes¹, Walid Fakhouri⁵, Antje Hottgenroth⁵, Raivo Kolde⁶, Sulev Reisberg^{6,7,8}, Carmen Olga Torre⁹, Talita Duarte-Salles¹⁰, Yesika Díaz¹⁰, Jose Felipe Golib-Dzib¹, Emily S. Brouwer¹, Edward Burn^{10,11}, Jennifer Lane¹¹, David Vizcaya¹², Sara Bruce Wirta¹³, Marcel de Wilde³, Katia Verhamme³, Peter R. Rijnbeek³, Elke Theander¹, Katerina Chatzidionysiou¹⁴, Daniel Prieto-Alhambra¹¹, Patrick B. Ryan^{1,2,15} and the EH DEN RA research group

Background

- Treatment guidelines recommend early initiation of conventional synthetic disease-modifying anti-rheumatic drugs (csDMARDs) following diagnosis of rheumatoid arthritis (RA), and specifically the use of methotrexate (MTX) as preferred first-line therapy
- Scarce evidence exists internationally on adherence to this guidance
- We characterized first-line csDMARD treatment patterns during the first year following an RA diagnosis in fourteen real world databases mapped to the Observational Medical Outcomes Partnership Common Data Model (OMOP CDM)

Data Sources

- Fourteen real world databases were mapped to the OMOP CDM from nine different countries: Australia (AU), Belgium (BE), Estonia (EE), France (FR), Japan (JP), The Netherlands (NL), Spain (ES), United Kingdom (UK) and United States (US)
- IQVIA (5): IQVIA US Ambulatory EMR (IQVIA Amb – EMR, US), IQVIA UK THIN IMRD EMR (IQVIA THIN – EMR, UK), IQVIA LPD France (IQVIA IMS – EMR, FR), IQVIA LPD Belgium EMR (IQVIA LPD – EMR, BE), IQVIA Australia EMR (IQVIA IMS – EMR, AU)
- IBM (3): IBM MarketScan Medicare Supplemental (IBM MDCR - Claims), IBM MarketScan Multi-State Medicaid (IBM MDCCD – Claims, US), IBM Commercial Claims and Encounters (IBM CCAE – Claims, US)
- Optum (2): Optum® de-identified Electronic Health Record (OPTUM EHR – EMR, US), Optum’s de-identified Clinformatics® Data Mart Database – Date of Death (OPTUM DOD – Claims, US)
- Integrated Primary Care Information (IPCI – EMR, NL).
- Japan Medical Data Center (JMDC – Claims, JP)
- Estonian Health Information System (Estonia – EMR, EE)
- Information System for Research in Primary Care (SIDIAP – EMR, ES)

Methods

- Patients 18 or older were indexed on the earlier of their first RA diagnosis or the initiation of a DMARD with an RA diagnosis within 30 days. Patients with a previous record of DMARD use or non-RA inflammatory arthritis were excluded
- Study period covered 2000-2018
- All DMARDs (CS, biologic, or targeted) were included for analyses, but only conventional synthetics were available in all databases.
- Analyses were performed using the open-sourced OHDSI Atlas software tool.

Results

- We identified 323,449 newly diagnosed RA patients with a first line csDMARD in the first year from index.
- Large variation between databases was observed (**Figure 1**)
- First line therapies across databases:
 - MTX: 33.3% to 74.5%
 - Hydroxychloroquine (HCQ): 10.1% to 30.2%
 - Sulfasalazine (SSZ): 0.9% to 28.7%
 - Leflunomide (LEF): 1.8% to 15.2%
 - MTX + HCQ: 2.1% to 6.7%

Conclusions

- Despite guideline recommendations for MTX to be first line therapy, data show large variations between databases and countries
- HCQ is used as first line monotherapy in a significant number of patients although not recommended

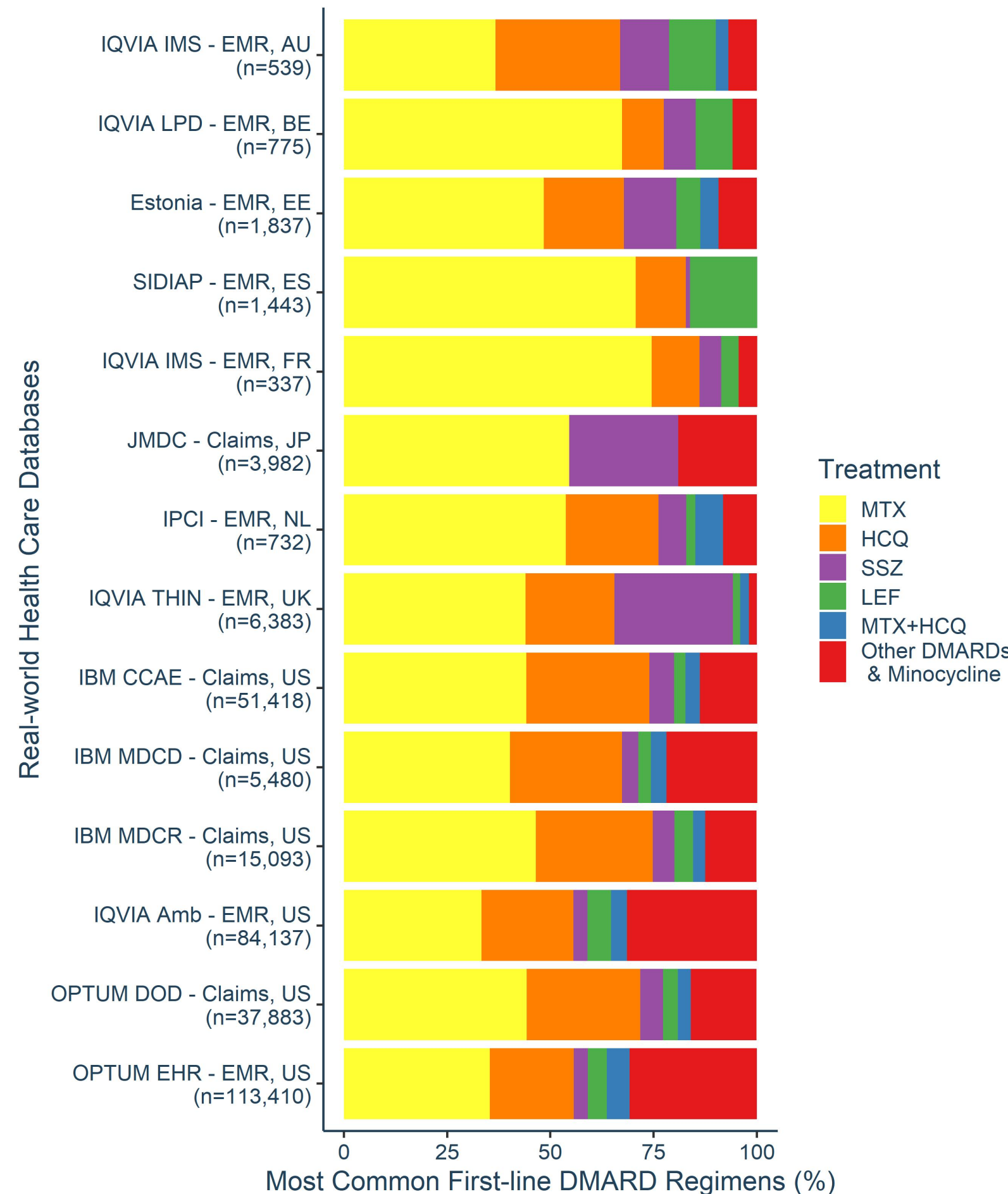


Figure 1: First line csDMARD treatment during 1yr from first observed RA diagnosis

¹ Janssen Europe, Middle East and Africa, USA, ² Observational Health Data Sciences and Informatics, New York, NY, USA, ³ Department of Medical Informatics, Erasmus MC, Rotterdam, The Netherlands, ⁴ Sanofi Aventis Group, France, ⁵ Eli Lilly and Company, United Kingdom, Germany ⁶ Institute of Computer Science, University of Tartu, Estonia, ⁷ STACC, Tartu, Estonia, ⁸ Quretec, Tartu, Estonia, ⁹ Real-World Solutions, IQVIA, United Kingdom, ¹⁰ Fundació Institut Universitari per a la recerca a l'Atenció Primària de Salut Jordi Gol i Gurina (IDIAPJGol), Barcelona, Spain, ¹¹ Centre for Statistics in Medicine (CSM), Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Oxford, UK, ¹² Epidemiology, Bayer, Barcelona, Spain, ¹³ Novartis Oncology, Sweden, ¹⁴ Dep of Medicine, Solna, Rheum Unit, Karolinska Institutet, Stockholm, Sweden, ¹⁵ Department of Biomedical Informatics, Columbia University, New York, NY, USA