



HAL
open science

Rheumatic Disease and COVID-19: Initial Data from the COVID-19 Global Rheumatology Alliance Provider Registries

Milena A Gianfrancesco, Kimme L Hyrich, Laure Gossec, Anja Strangfeld, Loreto Carmona, Elsa F Mateus, Paul Sufka, Rebecca Grainger, Zachary Wallace, Suleman Bhana, et al.

► To cite this version:

Milena A Gianfrancesco, Kimme L Hyrich, Laure Gossec, Anja Strangfeld, Loreto Carmona, et al.. Rheumatic Disease and COVID-19: Initial Data from the COVID-19 Global Rheumatology Alliance Provider Registries. *The Lancet Rheumatology*, 2020, 2 (5), pp.e250-e253. 10.1016/S2665-9913(20)30095-3. hal-03849960

HAL Id: hal-03849960

<https://hal.science/hal-03849960>

Submitted on 30 Apr 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

step-wise increases in allopurinol therapy with and without anti-inflammatory prophylaxis is needed.

Receiving care in a rural facility (1.02 [1.00–1.05] vs urban facility) and a community-based clinic (1.11 [1.08–1.14] vs VA Medical Center) was associated with higher MPR, whereas care in a facility with a smaller number of beds was associated with lower odds of adherence (≤ 50 beds 0.95 [0.91–0.98] vs > 200 beds). Given these findings, how does the size and type of facility affect adherence? A multifaceted nurse management intervention with contact “as often as required” has been found to be more effective than usual care for reaching urate targets.¹⁰ Further evaluation of the causes of these findings could provide actionable insights into our approach to commencing urate-lowering therapy.

Finally, follow-up testing of serum urate was associated with six-times higher odds of having an MPR of more than 80% (OR 5.94 [95% CI 5.82–6.07] vs no follow-up testing). Does this result reflect physicians and patients being engaged about gout, good access to health care, or both?³ Higher military service connection, and therefore better access and lower medication co-pays, was also associated with higher MPR, supporting the assertion that access to treatment plays a part in allopurinol adherence.

With this large dataset, further important questions can be asked. By including multiple allopurinol treatment episodes from individual patients, the pattern of MPR for subsequent episodes in the same patient can be examined. Do patients work up from a low MPR to a higher MPR over subsequent treatment courses or vice versa? Examining the characteristics of a declining MPR group versus a rising MPR group could help to identify characteristics in patients with gout that clinicians could look for and try to address.

Examining adherence characteristics through the lens of Andersen’s behavioural model, Singh and colleagues have provided a valuable insight into how patients are likely to behave when they walk out the office door with a prescription for allopurinol. Their study has provided critical new insights and generated further questions in the quest to improve allopurinol adherence.

I declare no competing interests.

Philip C Robinson
philip.robinson@uq.edu.au

University of Queensland School of Clinical Medicine, Faculty of Medicine, Brisbane, QLD 4006, Australia

- 1 Spencer K, Carr A, Doherty M. Patient and provider barriers to effective management of gout in general practice: a qualitative study. *Ann Rheum Dis* 2012; **71**: 1490–95.
- 2 Lindsay K, Gow P, Vanderpyl J, Logo P, Dalbeth N. The experience and impact of living with gout: a study of men with chronic gout using a qualitative grounded theory approach. *J Clin Rheumatol* 2011; **17**: 1–6.
- 3 Pascual E, Sivera F. Why is gout so poorly managed? *Ann Rheum Dis* 2007; **66**: 1269–70.
- 4 Dalbeth N, House ME, Horne A, Petrie KJ, McQueen FM, Taylor WJ. Prescription and dosing of urate-lowering therapy, rather than patient behaviours, are the key modifiable factors associated with targeting serum urate in gout. *BMC Musculoskelet Disord* 2012; **13**: 174.
- 5 Leonardo N, Lester S, Whittle S, Rischmueller M. Review of gout clinic in a tertiary hospital setting. *Intern Med J* 2020; **50**: 117–20.
- 6 Singh JA, Richman J, Yang S, Bridges SL, Saag K. Allopurinol adherence and its predictors in gout: a national cohort study in US veterans. *Lancet Rheumatol* 2020; **2**: e281–91.
- 7 Andersen R, Newman JF. Societal and individual determinants of medical care utilization in the United States. *Milbank Mem Fund Q Health Soc* 1973; **51**: 95–124.
- 8 Babitsch B, Gohl D, von Lengerke T. Re-revisiting Andersen’s behavioral model of health services use: a systematic review of studies from 1998–2011. *Psychosoc Med* 2012; **9**: Doc11.
- 9 Yamanaka H, Tamaki S, Ide Y, et al. Stepwise dose increase of febuxostat is comparable with colchicine prophylaxis for the prevention of gout flares during the initial phase of urate-lowering therapy: results from FORTUNE-1, a prospective, multicentre randomised study. *Ann Rheum Dis* 2018; **77**: 270–76.
- 10 Doherty M, Jenkins W, Richardson H, et al. Efficacy and cost-effectiveness of nurse-led care involving education and engagement of patients and a treat-to-target urate-lowering strategy versus usual care for gout: a randomised controlled trial. *Lancet* 2018; **392**: 1403–12.



Rheumatic disease and COVID-19: initial data from the COVID-19 Global Rheumatology Alliance provider registries

Published Online
April 16, 2020
[https://doi.org/10.1016/S2665-9913\(20\)30095-3](https://doi.org/10.1016/S2665-9913(20)30095-3)

Individuals with inflammatory rheumatic disease require special consideration with regard to coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Many of these individuals are considered at-risk for serious infections due to their immunocompromised state resulting from their underlying immune conditions and use

of targeted immune-modulating therapies such as biologics.^{1–4} However, some disease-modifying drugs commonly used to treat rheumatic diseases, such as hydroxychloroquine, are being investigated as potential therapies for COVID-19.⁵ Other commonly used therapies, such as biologics targeting interleukin (IL)-6 (eg, tocilizumab, sarilumab) and IL-1 (eg, anakinra),

are being assessed in patients with COVID-19 and who have subsequently developed pathological immune responses, including cytokine storm (eg, reactive haemophagocytic lymphohistiocytosis).⁶ Whether background immunosuppressive medications put individuals with rheumatic disease at an increased or decreased risk for severe SARS-CoV-2 infection is unknown,⁷ and evidence is lacking to guide treatment decisions. A general understanding of COVID-19 characteristics in this population is urgently needed to inform management guidelines and identify high-risk individuals during the pandemic.

The need for data to answer these key clinical questions was quickly realised and coordinated on a global scale by rheumatologists, researchers, and patients with rheumatic diseases. Despite the recognised track-record of high-quality observational drug safety research in rheumatology within multiple national biological registries,⁸ immediate data on COVID-19-specific outcomes would need to be collected to address this demand. Therefore, the international rheumatology community mobilised at an unprecedented pace to create the COVID-19 Global Rheumatology Alliance. In less than 1 week, the COVID-19 Global Rheumatology Alliance successfully developed online portals and case report forms to enable health-care providers around the world to enter information on individuals with rheumatic disease who have been diagnosed with COVID-19.

Registry data elements include provider name, city, country, and clinic, and individual patient-level sociodemographic information, including age, sex, race, and ethnicity. Data regarding rheumatic disease are captured, including medications before COVID-19 diagnosis, disease activity, and comorbidities. Information on COVID-19-related illness includes diagnosis date, symptoms, treatment, and outcomes, such as admission to hospital and maximum level of care (eg, need for supplemental oxygen, invasive ventilation). Laboratory results for other co-infections, IL-6 concentrations, leucopenia, and more are also collected, if available.

Due to international data legislation, in particular, the European General Data Protection Regulations, parallel data entry points (one limited to European League Against Rheumatism [EULAR]-participating countries, the other limited to sites globally) have been launched. Both data entry points link to secure RedCap survey platforms hosted by The University of Manchester (Manchester, UK), and the University of California, San Francisco (UCSF;

	Cohort (n=110)
Sex	
Female	79 (72%)
Male	31 (28%)
Aged >65 years	20 (18%)
Primary rheumatic disease*	
Rheumatoid arthritis	40 (36%)
Psoriatic arthritis	19 (17%)
Systemic lupus erythematosus	19 (17%)
Axial spondyloarthritis	7 (6%)
Vasculitis	7 (6%)
Sjogren's syndrome	5 (5%)
Other	17 (15%)
Medications before diagnosis of COVID-19	
Conventional synthetic DMARDs†	69 (63%)
Biological DMARDs‡	49 (45%)
JAK inhibitor	5 (5%)
NSAIDs†	28 (25%)
Glucocorticoids	27 (25%)
Other§	5 (5%)
Five most common COVID-19 symptoms at onset	
Fever	87 (79%)
Cough	85 (77%)
Shortness of breath	55 (50%)
Myalgia	49 (45%)
Sore throat	41 (37%)
Admitted to hospital	39 (35%)
Died	6 (5%)
Five most common comorbid conditions	
Hypertension	31 (28%)
Lung disease¶	22 (20%)
Cardiovascular disease	12 (11%)
Morbid obesity (BMI ≥40 kg/m ²)	9 (8%)
Diabetes	9 (8%)

Data are n (%). COVID-19=coronavirus disease 2019. DMARD=disease-modifying antirheumatic drug. NSAID=nonsteroidal anti-inflammatory drugs. JAK=Janus kinase. BMI=body-mass index. *Individuals could have more than one rheumatic disease diagnosis; other included (all with n <5): inflammatory myopathy, ocular inflammation, other inflammatory arthritis, polymyalgia rheumatica, sarcoidosis, systemic sclerosis, osteoporosis, psoriasis, isolated pulmonary capillaritis, gout, and autoinflammatory disease. †Conventional synthetic DMARD medications included antimalarials, azathioprine, cyclophosphamide, ciclosporine, leflunomide, methotrexate, mycophenolate mofetil, mycophenolic acid, sulfasalazine, and tacrolimus. ‡Biological DMARDs included abatacept, belimumab, CD20 inhibitors, IL-1 inhibitors, IL-6 inhibitors, IL-12 and IL-23 inhibitors, IL-17 inhibitors, and tumor necrosis factor inhibitors. §Other included antifibrotics, apremilast, intravenous immunoglobulin, thalidomide or lenalidomide, and other not specified. ¶Chronic obstructive pulmonary disease, asthma, interstitial lung disease, or other not specified.

Table: Demographic and disease characteristics of individuals with rheumatic disease diagnosed with COVID-19 in the COVID 19 Global Rheumatology Alliance registry as of April 1, 2020

San Francisco, CA, USA), where providers submit data on individuals with rheumatic disease who have been diagnosed with COVID-19. Individual patient consent is not required for this registry, which was determined “not human subjects research” by the UK Health Research Authority, The University of Manchester, the US Federal Guidelines by UCSF, and several other institutions.

For the COVID-19 Global Rheumatology Alliance website see www.rheum-covid.org

For the European data entry website see www.eular.org/eular_covid19_database.cfm

For the global data entry point see www.rheum-covid.org/provider-global/

As of April 1, 2020, 110 individuals with rheumatic disease who have been diagnosed with COVID-19 are included from six continents: Europe, North America, South America, Asia, Africa, and Oceania; a summary of data associated with these individuals is shown in the table.

We present proof-of-principle that, with global cooperation, the rapid collection of data during an international crisis is possible. Within 1 week of launching the registry, rheumatology providers from around the world have submitted data on more than 100 cases, allowing very preliminary characterisation and rapid dissemination of information regarding COVID-19 in individuals with rheumatic disease. Over time, the registry aims to examine differences in severity of outcomes by sociodemographic and rheumatic disease characteristics, medications taken before diagnosis of COVID-19, and medications administered on diagnosis. These data will serve to inform treatment strategies and better characterise individuals at increased risk of infection.

The strengths of the COVID-19 Global Rheumatology Alliance registry include global representation of individuals with rheumatic disease with COVID-19, which increases the power of the evidence base to examine important risk factors and outcomes. We expect that a major contribution of the COVID-19 Global Rheumatology Alliance will be rapid dissemination of information, since existing national patient registries might be less equipped to capture data on a global scale, given fixed timepoints and restrictions on consent of new individuals.

The registry is not without limitations, including a potential selection bias towards more severe cases, because in many countries only individuals with severe symptoms are being tested for COVID-19. Rheumatologists reporting cases are also under extreme pressure to work outside of rheumatology and provide front-line medical care to all patients with COVID-19 and might be unable to report cases, or reporting might be delayed. Duplicate entries might occur across different providers, although our data analytics teams carefully examine and address data quality on a regular basis. Also, despite including individuals from across the world, specific adjusted analyses might not be possible due to sample size. Finally, as the whole denominator of individuals with rheumatic diseases

who acquire COVID-19 is unknown, the database will be unable to provide accurate estimates of the risk of specific outcomes across the entire rheumatic disease population or in association with specific treatments. With time, existing patient registries and administrative databases will provide these data, but likely not until the current pandemic has ended, thus strengthening the current and critical role of this database.

In summary, the COVID-19 Global Rheumatology Alliance represents the commitment of rheumatologists to generate rapid data to help inform the care of individuals with rheumatic disease and those using immunomodulating therapies. Information from this database will provide timely and responsive real-world data where large literature gaps exist, informing providers of treatment patterns for individuals diagnosed with COVID-19, and offering a better understanding of possible risk factors associated with severe outcomes in the rheumatic disease population.

MAG and KLH contributed equally, and PMM and JY contributed equally. JY and PR designed and directed the study. MAG and KLH did the data analyses. All authors contributed equally to data interpretation, writing, and final approval of the manuscript. MAG is supported by the US National Institutes of Health (K01 AR070585, NIAMS). KLH has received speaker's fees from Abbvie and grant income from Bristol-Myers Squibb, UCB Pharma, and Pfizer. KLH is supported by the UK National Institute for Health Research (NIHR) Manchester Biomedical Research Centre. LG reports personal consultant fees from Abbvie, Biogen, Celgene, Janssen, Eli Lilly, Novartis, Pfizer, Sanofi-Aventis, and UCB Pharma, and grants from Eli Lilly, Mylan, and Pfizer. AS has received an independent research grant from a consortium of 13 companies (among them AbbVie, Bristol-Myers Squibb, Celltrion, Fresenius Kabi, Eli Lilly, Mylan, Hexal, MSD, Pfizer, Roche, Samsung, Sanofi-Aventis, and UCB Pharma) and reports personal fees from lectures for AbbVie, MSD, Roche, Bristol-Myers Squibb, and Pfizer. EFM reports that Portuguese League Against Rheumatic Diseases received support on her behalf for specific activities: grants and non-financial from Pfizer, grants from Lilly Portugal, Sanofi, AbbVie, Novartis, Grünenthal SA, MSD, Celgene, Medac, Janssen-Cilag, Pharmakern, and GAIPA, and non-financial support from Grünenthal GmbH. PS reports support from American College of Rheumatology and Wiley. RG reports non-financial support and personal fees from Pfizer Australia; personal fees from Cornerstones, Janssen New Zealand, and Novartis; and non-financial support from Janssen Australia. ES reports support from the Canadian Arthritis Patient Alliance. JSH reports personal fees from Novartis, grants from Rheumatology Research Foundation and Childhood Arthritis and Rheumatology Research Alliance. PR reports personal fees from Abbvie, Pfizer, UCB Pharma, Novartis, Eli Lilly, and Janssen, and non-financial support from Roche. PMM has received consulting or speaker's fees from Abbvie, Eli Lilly, Novartis, and UCB Pharma. PMM is supported by the NIHR University College London Hospitals Biomedical Research Centre. JY has received an independent research grant from Pfizer and research consulting fees from Eli Lilly and AstraZeneca. JY is supported by the Alice Betts Endowed Chair in Arthritis Research, the Russel/Engleman Research Center at the University of California, San Francisco (NIAMS/NIH P30 AR070155 and NIH/NIAMS K24AR074534). All other authors declare no competing interests. The views expressed here are those of the authors and not necessarily those of the National Institutes of Health, UK National Health Service, the NIHR, or the UK Department of Health. The views expressed here are those of the authors and participating members of the COVID-19 Global Rheumatology Alliance, and do not necessarily represent the views of the American College of Rheumatology, or any other organisation.

*Milena A Gianfrancesco, Kimme L Hyrich, Laure Gossec, Anja Strangfeld, Loreto Carmona, Elsa F Mateus, Paul Sufka, Rebecca Grainger, Zachary Wallace, Suleman Bhana, Emily Sirotych, Jean Liew, Jonathan S Hausmann, Wendy Costello, Philip Robinson, Pedro M Machado, Jinoos Yazdany, and the COVID-19 Global Rheumatology Alliance Steering Committee†
 milena.gianfrancesco@ucsf.edu

†Members of the COVID-19 Global Rheumatology Alliance Steering Committee are listed in the appendix (p 1).

Division of Rheumatology, Department of Medicine, University of California San Francisco, San Francisco, 94143 CA, USA (MAG, JY); Centre for Epidemiology Versus Arthritis, The University of Manchester, Manchester Academic Health Science Centre, Manchester, UK (KLH); National Institute of Health Research Manchester Biomedical Research Centre, Manchester University NHS Foundation Trust, Manchester Academic Health Science Centre, Manchester, UK (KLH); Sorbonne Université, INSERM, Institut Pierre Louis d'Epidémiologie et de Santé Publique, Paris France (LG); Rheumatology Department, Pitié-Salpêtrière hospital, AP-HP, Paris, France (LG); Epidemiology Unit, German Rheumatism Research Center (DRFZ Berlin), Berlin, Germany (AS); Instituto de Salud Musculoesquelética, Madrid, Madrid, Spain (LC); Portuguese League Against Rheumatic Diseases (LPCDR), Lisbon, Portugal; EULAR Standing Committee of PARE (People with Arthritis Rheumatism in Europe), Zurich, Switzerland (EFM); Healthpartners, St. Paul, MN, USA (PS); Department of Medicine, University of Otago, Dunedin, Otago, New Zealand (RG); Massachusetts General Hospital (ZW) and Program in Rheumatology, Boston Children's Hospital; Division of Rheumatology and Clinical Immunology, Beth Israel Deaconess Medical Center (JSH), Harvard Medical School, Boston, MA, USA; Crystal Run Health, Middletown, NY, USA (SB); Department of Health Research Methods, Evidence, and Impact, McMaster University, Hamilton, ON,

Canada (ES); Canadian Arthritis Patient Alliance, Toronto, ON, Canada (ES); Division of Rheumatology, University of Washington, Seattle, WA, USA (JL); Irish Children's Arthritis Network (iCAN), Tipperary, Ireland (WC); University of Queensland Faculty of Medicine, Brisbane, QLD, Australia (PR); Centre for Rheumatology and Department of Neuromuscular Diseases, University College London, London, UK (PMM); Department of Rheumatology and Queen Square Centre for Neuromuscular Diseases, University College London Hospitals NHS Foundation Trust, London, UK (PMM); and Department of Rheumatology, Northwick Park Hospital, London North West University Healthcare NHS trust, London, UK (PMM)

- 1 Furst DE. The risk of infections with biologic therapies for rheumatoid arthritis. *Semin Arthritis Rheum* 2010; **39**: 327–46.
- 2 Kahl LE. Herpes zoster infections in systemic lupus erythematosus: risk factors and outcome. *J Rheumatol* 1994; **21**: 84–86.
- 3 Kourbeti IS, Ziakas PD, Mylonakis E. Biologic therapies in rheumatoid arthritis and the risk of opportunistic infections: a meta-analysis. *Clin Infect Dis* 2014; **58**: 1649–57.
- 4 Winthrop KL. Infections and biologic therapy in rheumatoid arthritis: our changing understanding of risk and prevention. *Rheum Dis Clin North Am* 2012; **38**: 727–45.
- 5 Kim AHJ, Sparks JA, Liew JW, et al. A rush to judgment? Rapid reporting and dissemination of results and its consequences regarding the use of hydroxychloroquine for COVID-19. *Ann Intern Med* 2020; published online March 30. DOI:10.7326/M20-1223.
- 6 Mehta P, McAuley DF, Brown M, et al. COVID-19: consider cytokine storm syndromes and immunosuppression. *Lancet* 2020; **395**: 1033–34.
- 7 Favalli EG, Ingegnoli F, De Lucia O, Cincinelli G, Cimaz R, Caporali R. COVID-19 infection and rheumatoid arthritis: faraway, so close! *Autoimmun Rev* 2020; published online March 20. DOI:10.1016/j.autrev.2020.102523.
- 8 Nikiphorou E, Buch MH, Hyrich KL. Biologics registers in RA: methodological aspects, current role and future applications. *Nat Rev Rheumatol* 2017; **13**: 503–10.

See Online for appendix