ABSTRACT NUMBER: 0087

TNF Inhibitors and the Risk of Adverse COVID-19 Outcomes in Patients with Immune-Mediated Inflammatory Disease: Pooled Data from Three Global Registries

Zara Izadi[1], Erica Brenner[2], Satveer Mahil[3], Nick Dand[4], Zenas Yiu[5], Mark Yates[4], Ryan Ungaro[6], Xian Zhang[2], Manasi Agrawal[6], Jean-Frederic Colombel[7], Milena Gianfrancesco[1], Kimme Hyrich[5], Anja Strangfeld[8], Loreto Carmona[9], Elsa Frazão Mateus[10], Saskia Lawson-Tovey[5], Eva Klingberg[11], Giovanna Cuomo[12], Marta Caprioli[13], Rene-Marc FLIPO[14], Ana Rita Cruz-Machado[15], Carolina Mazeda[16], Rebecca Hasseli[17], Alexander Pfeil[18], Hanns-Martin Lorenz[19], Laura Trupin[20], Stephanie Rush[1], Patricia Katz[1], Gabriela Schmajuk[1], Lindsay Jacobsohn[21], Andrea Seet[1], Samar Al Emadi[22], Leanna Wise[23], Emily Gilbert[24], Ali Duarte-Garcia[25], Maria Valenzuela-Almada[26], Carolina Isnardi[27], Rosana Quintana[27], Enrique Soriano[28], Tiffany Hsu[29], Kristin D'Silva[30], Jeffrey Sparks[31], Naomi Patel[30], Viviane de Souza[32], Licia Maria Henrique Mota[33], Ana Paula Reis[34], Zachary S. Wallace[35], Suleman Bhana[36], Wendy Costello[37], Rebecca Grainger[38], Jonathan Hausmann[39], Jean Liew[40], Emily Sirotich[41], Paul Sufka[42], Philip Robinson[43], Pedro Machado[44], Christopher Griffiths[45], Jonathan Barker[4], Catherine smith[4], Jinoos Yazdany[1] and Michael Kappelman[2], [1]University of California San Francisco, San Francisco, CA, [2]University of North Carolina at Chapel Hill, Chapel Hill, NC, [3]St John's Institute of Dermatology, London, United Kingdom, [4]King's College London, London, United Kingdom, [5]University of Manchester, Manchester, United Kingdom, [6]Icahn School of Medicine at Mount Sinai, New York, NY, [7]MD, New York, NY, [8]Deutsches Rheuma-Forschungszentrum Berlin, Berlin, Germany, [9]Instituto de Salud Musculoesqueltica (InMusc), Madrid, Spain, [10]Liga Portuguesa Contra as Doenças Reumáticas (LPCDR), Lisbon, Portugal, [11]University of Gothenburg, Gothenburg, Sweden and Sahlgrenska University Hospital, Gothenburg, Sweden, [12]Università degli Studi della Campania Luigi Vanvitelli, Napoli, Italy, [13]IRCCS Humanitas Research Hospital, Milan, Italy, [14]Rheumatology Department, Lille University Hospital, Lille, France, [15]Rheumatology Department, Hospital de Santa Maria, Centro Hospitalar Universitário Lisboa Norte, Lisbon Academic Medical Center; Rheumatology Research Unit, Instituto de Medicina Molecular João Lobo Antunes, Faculdade de Medicina, Universidade de Lisboa, Lisbon, Portugal, [16]Rheumatology Department - Centro Hospitalar do Baixo Vouga and Ibimed, Institute for Biomedicine, University of Aveiro, Aveiro, Portugal, [17]Justus-Liebig-University Giessen, Bad Nauheim, Germany, [18]Friedrich Schiller University Jena, Jena, Germany, [19]University Hospital Heidelberg Germany, Heidelberg, Germany, [20]UC San Francisco, San Francisco, CA, [21]University of California San Francisco, Antioch, CA, [22]Hamad medical corporation, Doha, Qatar, [23]LAC+USC/Keck Medicine of USC, Pasadena, CA, [24]Mayo Clinic, Jacksonville, FL, [25]Mayo Clinic, Rochester, MN, [26]Division of Rheumatology, Mayo Clinic, Rochester, MN, [27]Argentine Society of Rheumatology, Buenos Aires, Argentina, [28]Hospital Italiano de Buenos Aires, Buenos Aires, Argentina, [29]Brigham and Women's Hospital, Jamaica Plain, MA, [30]Massachusetts General Hospital, Boston, MA, [31]Brigham and Women's Hospital and Harvard Medical School, Boston, MA, [32]UFJF, JUIZ DE FORA, Brazil, [33]Universidade de Brasília, Brasilia, Brazil, [34]Centro Universitrio de Braslia- UniCEUB, Brasilia, Brazil, [35]Harvard Medical School, Boston, MA, [36]Crystal Run Health, Montvale, NJ, [37]Irish Children's Arthritis Network, Bansha, Ireland, [38]University of Otago, Wellington, New Zealand, [39]Boston Children's Hospital / Beth Israel Deaconess Medical Center, Cambridge, MA, [40]Boston University, Boston, MA, [41]McMaster University, Hamilton, ON, Canada, [42]HealthPartners, Eagan, MN, [43]University of Queensland School of Clinical Medicine, Brisbane, Australia, [44]Centre for Rheumatology & Department of Neuromuscular Diseases, University College London, London, United

Kingdom, [45]University of Manchester, Manchester Centre for Dermatology Research, Manchester, United Kingdom

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SESSION INFORMATION

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Session Title: Epidemiology & Public Health Poster I: COVID-19 & Vaccination (0084–0117)

Session Time: 8:30AM-10:30AM

Background/Purpose: While tumor necrosis factor inhibitors (TNFi) are widely prescribed globally due to their high efficacy across immune-mediated inflammatory diseases (IMIDs), the impact of COVID-19 on individuals with IMIDs receiving TNFi remains poorly understood. The objective of this study was to assess the association between TNFi monotherapy and COVID-19-related hospitalization or death among individuals with IMIDs, compared to other commonly prescribed immunomodulatory regimens.

Methods: We used data from three global COVID-19 registries of individuals with rheumatic diseases, IBD, and psoriasis. Healthcare providers reported COVID-19 outcomes and demographic and clinical characteristics of individuals with IMIDs with confirmed or suspected COVID-19. We included resolved adult COVID-19 cases with a diagnosis of inflammatory arthritis (IA), IBD, or psoriasis reported on or before February 1st, 2021. Medication exposure was defined as a categorical variable with the following categories: TNFi monotherapy (reference), TNFi in combination with MTX, TNFi in combination with AZA/6-mercaptopurine (AZA/6MP), MTX monotherapy, AZA/6MP monotherapy, and janus kinase inhibitor (JAKi) monotherapy. The outcome was COVID-19-related hospitalization or death. Registry-level analyses and a pooled analysis of data across the three registries were conducted using multilevel multivariable mixed-effects logistic regression, adjusting for demographics, clinical characteristics, comorbidities, concomitant immunomodulatory medications, and accounting for country, calendar-month, and registry-level correlations. In a sensitivity analysis we excluded patients whose COVID-19 diagnosis was based on symptoms alone.

Results: A total of 6,077 cases from 74 countries were included. Mean (SD) age was 48.8 (16.5) years and 58.6% were female (Table). The most common diagnoses were rheumatoid arthritis (35.3%) and Crohn's disease (25.3%). Over one-fifth (21.3%) of cases were hospitalized for COVID-19 and 3.1% died. In the pooled analysis, compared with TNFi monotherapy, higher odds of hospitalization or death were observed with TNFi in combination with AZA/6MP (odds ratio: 1.7, 95% CI: 1.2-2.6), AZA/6MP monotherapy (1.8, 1.3-2.6), MTX monotherapy (2.0, 1.6-2.6), and JAKi monotherapy (1.8, 1.2-2.7). ORs obtained from registry-specific analyses were generally in the same direction and of similar magnitude as those obtained from the pooled analysis (Figure). Similar findings were obtained after excluding patients whose COVID-19 diagnosis was based on symptoms alone.

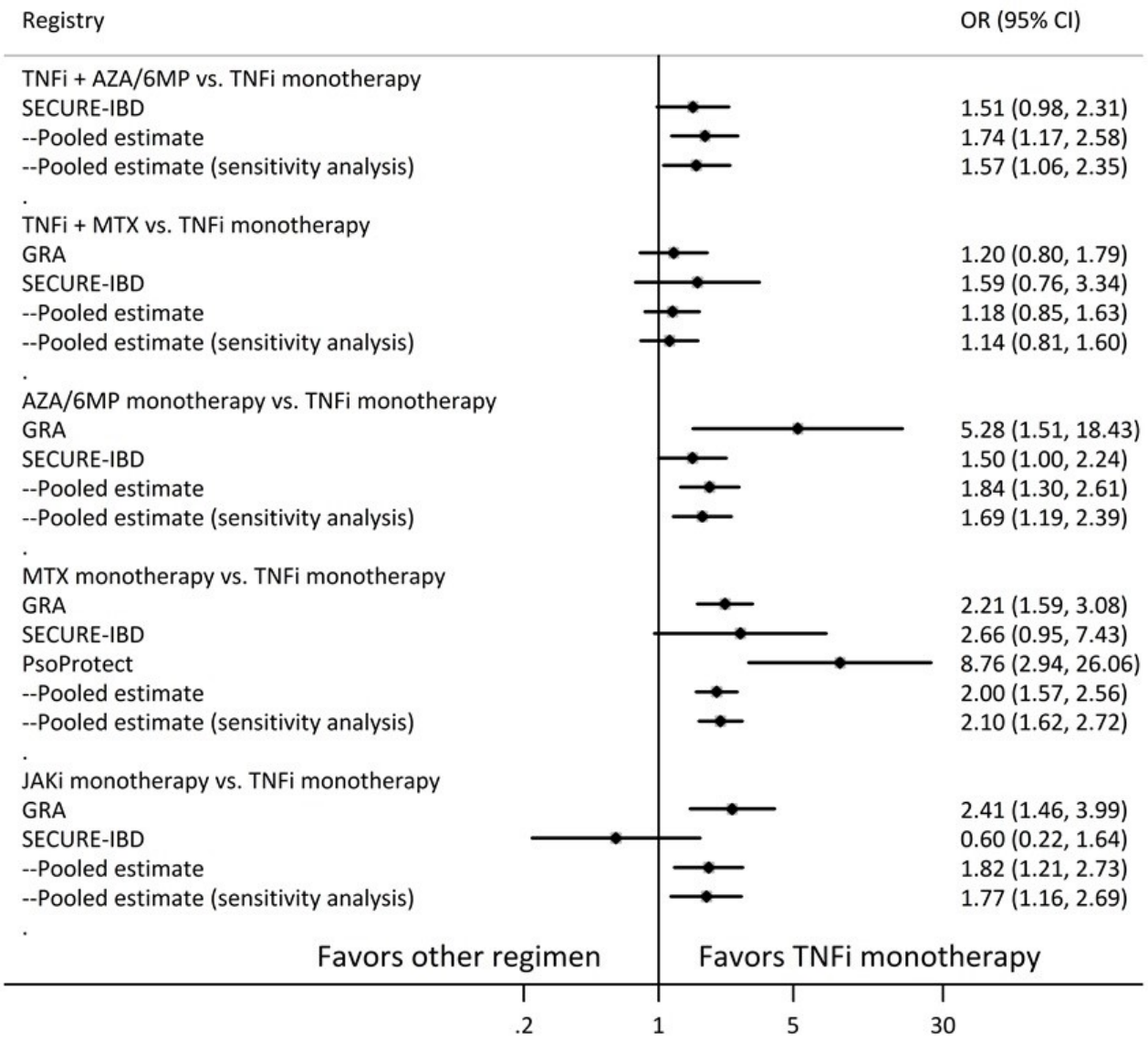
Conclusion: Among individuals with IMIDs, TNFi monotherapy is associated with a lower risk of adverse COVID-19 outcomes compared with other commonly prescribed immunomodulatory regimens. These data can help inform treatment decisions for individuals with IMIDs during the pandemic.

Table: Patient and clinical characteristics of the study population and COVID-19 outcomes.

	N (%) unless specified			
	GRA	**SECURE-IBD**	**PsoProtect**	**Pooled**
	N = 3,441	**N = 2,336**	**N = 300**	**N = 6,077**
Age, Mean (SD)	55.0 (14.4)	39.4 (15.4)	49.9 (12.6)	48.8 (16.5)
Sex*				
Male	1,144 (33.2)	1,139 (48.8)	185 (61.7)	2,468 (40.6)
Female	2,295 (66.7)	1,153 (49.4)	115 (38.3)	3,563 (58.6)
Unknown	2 (0.1)	44 (1.9)	0 (0)	46 (0.8)
Diagnoses*				
Rheumatoid arthritis only	2,146 (62.4)	-	-	2,146 (35.3)
Spondyloarthritis only	624 (18.1)	-	-	624 (10.3)
Psoriatic arthritis only	566 (16.4)	-	-	566 (9.3)
Other IA or >1 type of IA	105 (3.1)	-	-	105 (1.7)
Crohn's disease	-	1,537 (65.8)	-	1,537 (25.3)
IBD, unspecified	-	37 (1.6)	-	37 (0.6)
Ulcerative colitis	-	762 (32.6)	-	762 (12.5)
Psoriasis	-	-	300 (100)	300 (4.9)
Disease activity*				
Remission	1,067 (31.0)	1,369 (58.6)	75 (25.0)	2,511 (41.3)
Active disease	1,829 (53.2)	864 (37.0)	225 (75.0)	2,918 (48.0)
Unknown	545 (15.8)	103 (4.4)	0 (0)	648 (10.7)
Exposure regimens*				
TNFi monotherapy	1,183 (34.4)	1,445 (61.9)	216 (72.0)	2,844 (46.8)
TNFi + methotrexate	575 (16.7)	87 (3.7)	7 (2.3)	669 (11.0)
TNFi + Azathioprine/6MP	7 (0.2)	327 (14.0)	0 (0)	334 (5.5)
Methotrexate monotherapy	1,438 (41.8)	31 (1.3)	77 (25.7)	1,546 (25.4)
Azathioprine/6MP monotherapy	19 (0.6)	379 (16.2)	0 (0)	398 (6.5)
JAKi monotherapy	219 (6.4)	67 (2.9)	0 (0)	286 (4.7)
Hospitalization status*				
Not hospitalized	2,396 (69.6)	1,996 (85.4)	257 (85.7)	4,649 (76.5)
Hospitalized	939 (27.3)	316 (13.5)	42 (14.0)	1,297 (21.3)
Unknown	106 (3.1)	24 (1.0)	1 (0.3)	131 (2.2)
Death*				
Alive	3,266 (94.9)	2,282 (97.7)	297 (99.0)	5,845 (96.2)
Died	166 (4.8)	20 (0.9)	3 (1.0)	189 (3.1)
Unknown	9 (0.3)	34 (1.5)	0 (0)	43 (0.7)
Presumptive COVID-19 case**	752 (21.9)	0 (0)	112 (37.3)	864 (14.2)

*Categories are mutually exclusive. **Presumptive diagnosis was based on symptoms alone. Abbreviations: GRA: Global Rheumatology Alliance; SECURE-IBD: Secure Epidemiology of Coronavirus Under Research Exclusion for Inflammatory Bowel Disease; PsoProtect: Psoriasis Patient Registry for Outcomes, Therapy and Epidemiology of COVID_19 Infection. JAKi: janus kinase inhibitor; 6MP: 6-mercaptopurine; TNFi: tumor necrosis factor inhibitor; HCQ: hydroxychloroquine; GC: glucocorticoid; IA: inflammatory arthritis; IBD: inflammatory bowel disease.

Figure: Adjusted odds of COVID-19 related hospitalization or death for immunomodulatory treatment regimens compared with tumor necrosis factor inhibitor monotherapy in registry-specific and pooled analyses.



TNFi monotherapy is the reference category. Pooled sensitivity analysis excludes COVID_19 diagnoses based on symptoms alone. Odds ratios derived using multilevel multivariable mixed-effects logistic regression. Registry-level analyses adjusted for demographics, clinical characteristics, comorbidities, concomitant medications, and accounted for country and calendar-month correlations. Pooled analyses additionally accounted for registry-level correlations. Abbreviations: MTX: methotrexate; TNFi: tumor necrosis factor inhibitor; AZA/6MP: azathioprine/6-mercaptopurine; JAKi: janus kinase inhibitor. N = 3,523 (GRA); 2,336 (SECURE-IBD); 300 (PsoProtect); 6,159 (Pooled); 5,223 (Pooled, sensitivity analysis).

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