Psoriasis adverse events and associated medications as reported in the US Food and Drug Administration's Adverse Event Reporting System from 2016 to 2021

To the Editor: Medications that have been reported to exacerbate or induce psoriasis include β-adrenergic blockers (β-blockers), lithium, and antimalarial drugs; however, recent systematic reviews of drug-associated psoriasis are limited, and new causative agents are frequently being reported.[1] We evaluated all reports of psoriasis adverse events in the US Food and Drug Administration's Adverse Event Reporting System from January 1, 2016, through September 30, 2021, excluding medications that have been approved by the US Food and Drug Administration to treat psoriasis or psoriatic arthritis.

The medications most commonly reported for psoriasis adverse events were prednisone, tocilizumab, hydroxychloroquine, and dupilumab, with 674, 513, 437, and 376 reports, respectively (Table I). Prednisone was the most commonly reported medication, and it is well known to flare psoriasis upon withdrawal. Previous studies have reported that 31% to 42% of the patients with preexisting psoriasis have an exacerbation after the use of antimalarials.[1] Corresponding to the increased use of hydroxychloroquine for treatment of COVID-19, the highest number of hydroxychloroquine reports by year occurred in 2020.[2] This same trend of a notable increase in reports in 2020 is observed with tocilizumab, a monoclonal antibody, which was reported to improve outcomes in patients with severe COVID-19–related pneumonia.[3,4] With 376 reports of psoriasis as an adverse event of dupilumab since its approval in 2017, and association via case reports in the literature, this is an emerging medication that warrants consideration. As the use of PD-1 inhibitors such as nivolumab increases, there may be a subsequent increase in reporting of psoriasis, with 175 cases already noted.

The only β-blocker that made it into the top 50 most reported medications was metoprolol, with 97 reports despite the fact that they are one of the most frequently prescribed medications in the United States.[1,5] More recent studies discussing the mechanism of β-blocker–induced psoriasis describe this side effect as "rare" overall, despite it being the most frequent type of cutaneous reaction to β-blockers.[1,5] Although lithium has traditionally been associated with drug-induced psoriasis, it had just 20 reports since 2016—a finding that may be secondary to the low frequency of lithium prescriptions in the United States relative to the other medications on the list.

Although it is a useful tool for observing reporting trends, there are several limitations of the US Food and Drug Administration's Adverse Event Reporting System database. These include that rates of occurrence cannot be established from this database, and thus one cannot definitively compare 2 medications within the database; that the presence of a report cannot establish causation between the adverse

Table I. Reports by year for the top 10 reported medications on the US Food and Drug Administration's Adverse Event Reporting System since 2016

Rank	Drug generic name	Reports by year						Total reports since 2016
		2021*	2020	2019	2018	2017	2016	
1	Prednisone	207	285	94	39	22	27	674
2	Tocilizumab	108	252	75	33	27	18	513
3	Hydroxychloroquine	103	217	64	29	13	11	437
4	Dupilumab	170	113	69	24	-	-	376
5	Morphine	86	142	29	17	1	4	279
6	Anakinra	62	139	31	11	3	2	248
7	Amlodipine	75	48	37	18	4	13	195
8	Codeine	65	87	17	8	3	-	180
9	Human IgG	50	80	29	6	1	11	177
10	Nivolumab	27	31	27	41	32	17	175

*For 2021, reports are recorded up until only September 30, 2021.

event and reported drug, as the information in the reports is not verified and reflects only the reporter's observations; that the data are subject to reporting bias, for example, medications that are already known to be associated with psoriasis may be less likely to be reported; and that there is the potential for confounders such as underlying disease or concurrent medications that are not controlled for in the study population.

Overall, this study supports the importance of providers considering patients' medications when assessing new or worsening psoriasis, in light of the new availability of medications and changing prescription habits.

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Funding sources: None.

IRB approval status: Exempt.

Key words: adverse events; drug reactions; drug-induced psoriasis; immunodermatology; psoriasis.

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Conflicts of interest

Dr Rosmarin has received honoraria as a consultant for AbbVie, Abcuro, AltruBio, Boehringer-Ingelheim, Bristol Meyers Squibb, Celgene, Concert, CSL Behring, Dermavant, Dermira, Incyte, Janssen, Kyowa Kirin, Lilly, Novartis, Pfizer, Regeneron, Sanofi, Sun Pharmaceuticals, UCB, and VielaBio; has received research support from AbbVie, Amgen, Bristol Meyers Squibb, Celgene, Dermira, Galderma, Incyte, Janssen, Lilly, Merck, Novartis, Pfizer, and Regeneron Pharmaceuticals Inc; and has served as a paid speaker for AbbVie, Amgen, Celgene, Janssen, Lilly, Novartis, Pfizer, Regeneron Pharmaceuticals Inc, and Sanofi. Dr Sobell has served as an investigator, as a consultant, and/or on speakers bureau for AbbVie, Amgen, Bristol Myers Squibb, Cara, Celgene, Eli Lilly, Janssen, Novartis, Regeneron, Sanofi Genzyme, Sun Pharma, and UCB. Author Learned and Drs Alsukait, Deverapalli, Elliott, Moody, Konnikov, and Ortega have no conflicts of interest to declare.

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https://doi.org/10.1016/j.jdin.2022.03.010