were used to identify dermatology patients on immunosuppressive therapies, of which 544 patients had at least 2 serologic TB tests. Patients were excluded if they had a positive TB test before initiating immunosuppressive therapy. TB screening tests included were interferon-γ release assays, such as QuantiFERON-TB Gold (QFT-GIT; Quest Diagnostics, Secaucus, NJ) and T-SPOT.*TB* (Oxford Immunotec USA, Marlborough, MA). We considered patients with positive interferon-γ release assays to have evidence of latent TB (Fig 1). Borderline T-SPOTs were considered positive if repeat testing was borderline, and indeterminate QFT-GIT results were considered negative. One percent (6 of 544) of patients had a false indeterminate/borderline result that was negative on repeat testing.

During immunosuppressant treatment, 13 of 544 patients (2.4%; median age, 59 years) had a positive TB test. Of the 13 patients, 7 (53.8%) were taking TNF inhibitors, with an average of 15.6 months to seroconversion, and 6 (46.1%) were receiving other immunosuppressant therapies, such as methotrexate, with an average of 26.4 months to seroconversion. Twelve (92%) were being treated for psoriasis or psoriatic arthritis, and 9 (69%) were nonwhite (Fig 1). In patients who tested positive, medications were stopped, and therapy would not be reinitiated until initiation of latent TB treatment by infectious disease specialists or the Health Department TB clinic.

Our study shows high rates of seroconversion in patients receiving immunosuppressant therapy in a high-prevalence area. Patients taking TNF inhibitors seroconverted earlier than patients taking other immunosuppressive agents. Patients taking methotrexate and prednisone had an average time to seroconversion that was nearly double that of the TNF inhibitor group.

Limitations of the study include the retrospective study design and the selection bias of patients with psoriasis over other dermatologic diseases.

This study supports annual TB screening in patients taking TNF inhibitors and oral systemic agents in areas of high TB prevalence.

Erika Elliott, BA, Rebecca Sarac, MD, Soraya Foutouhi, MS, PhD, MD, Jalal Maghfour, MS, Nayha Patel, BA, Juliana Martel, BA, and Andrea Murina, MD

From the Department of Dermatology, Tulane University School of Medicine, New Orleans, Louisiana.

Erika Elliott and Drs Sarac and Foutouhi contributed equally to this work.

Funding sources: None.

Conflicts of interest: Dr Murina is a speaker for AbbVie, Celgene, Janssen, and Novartis. Erika Elliott, Drs Sarac and Foutouhi, Jalal Maghfour, Nayha Patel, and Juliana Martel have no conflicts of interest to declare.

IRB approval status: Reviewed and approved by Tulane Institutional Review Board.

Reprints not available from the authors.

Correspondence to: Erika Elliott, Tulane University School of Medicine, Department of Dermatology, 1430 Tulane Ave, #8036, New Orleans, LA 70112

E-mail: eelliot4@tulane.edu

REFERENCES

1. Centers for Disease Control and Prevention. Latent TB Infection in the United States - Published Estimates. September 28, 2018.. Available at: https://www.cdc.gov/tb/statistics/ltbi.htm. Accessed August 30, 2019.
2. Menter A, Strober BE, Kaplan DH, et al. Joint AAD-NPF guidelines of care for the management and treatment of psoriasis with biologics. *J Am Acad Dermatol*. 2019;80(4):1029-1072.
3. Chung J, Aronson AB, Srikantha R, et al. Low conversion rate of QuantiFERON-TB Gold screening tests in patients treated with tumor necrosis factor inhibitors: a retrospective cohort study identifying an important practice gap. *J Am Acad Dermatol*. 2018;79(1):169-171.
4. Yoo Kathryn. Demographic Trends in Tuberculosis in Louisiana, 2010-2018. Louisiana Department of Health, Office of Public Health, Tuberculosis Control Program, 2019.. Available at: ldh.la.gov/assets/oph/Center-PHCH/Center-PH/tuber/Demographic_Trends_2018_report.pdf. Accessed August 30, 2019.

https://doi.org/10.1016/j.jaad.2019.12.032

Ustekinumab does not increase tuberculosis risk: Results from a national database in South Korea

To the Editor: Biologics have become the main treatment modality for psoriasis in recent decades.[1] Ustekinumab, a monoclonal antibody against human interleukin 12 and 23, exhibits high efficacy with relatively low adverse events among various biologics for psoriasis.[2] Although no active tuberculosis was reported after isoniazid prophylaxis in patients with latent tuberculosis in 5 phase 3 trials of ustekinumab,[2] the relationship between ustekinumab and tuberculosis infection is still unclear. The purpose of this study was to evaluate the risk of active tuberculosis infection in Korean patients treated with ustekinumab. The prevalence of psoriasis in South Korea is comparable to that in other Asian populations, at approximately 0.5%.[3]

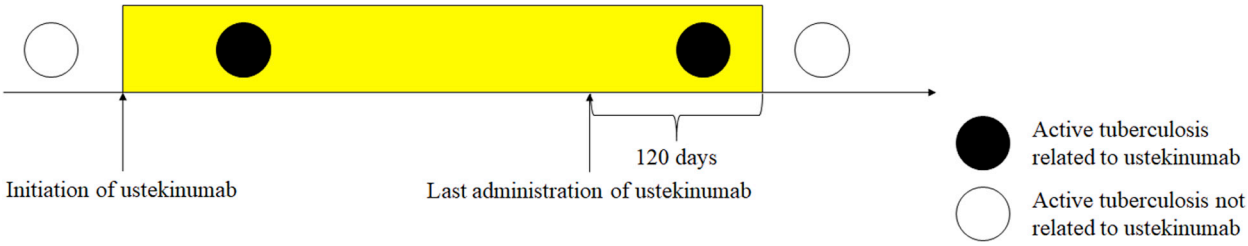

Fig 1. Definition of active or latent tuberculosis related to ustekinumab. Yellow indicates inclusion time.

Table I. Expected and observed incidence of tuberculosis

	Men				Women			
			Active TB				Active TB	
Age, years	No. (%)	Person-years*	Expected†	Observed	No. (%)	Person-years*	Expected†	Observed
10–14	0	0	0	0	1 (0.1)	0.4	0.000	0
15–19	22 (1.2)	32.6	0.009	0	12 (1.3)	31.1	0.006	0
20–24	64 (3.4)	130.1	0.048	0	52 (5.8)	97.6	0.042	0
25–29	124 (6.5)	292.7	0.164	0	70 (7.8)	178.7	0.099	0
30–34	218 (11.4)	507.4	0.231	0	71 (7.9)	154.6	0.062	0
35–39	247 (13.0)	579.1	0.248	0	110 (12.2)	217.7	0.076	1
40–44	259 (13.6)	620.0	0.343	0	93 (10.3)	218.5	0.069	0
45–49	276 (14.5)	603.9	0.400	0	112 (12.5)	259.4	0.079	0
50–54	215 (11.3)	508.6	0.412	0	115 (12.8)	300.2	0.107	0
55–59	212 (11.1)	439.9	0.420	1	106 (11.8)	214.9	0.082	0
60–64	125 (6.6)	227.8	0.244	1	61 (6.8)	132.5	0.059	0
65–69	70 (3.7)	139.8	0.187	0	45 (5.0)	100.0	0.068	0
70–74	41 (2.2)	75.1	0.127	0	22 (2.4)	34.9	0.038	0
75–79	24 (1.3)	60.4	0.155	0	19 (2.1)	33.7	0.064	0
≥80	7 (0.4)	9.0	0.039	0	10 (1.1)	23.7	0.067	0
Total	1904	4226.4	3.027	2	899	1997.9	0.918	1

Sex- and age-adjusted expected number of active tuberculosis cases and observed outcomes in 2803 patients receiving ustekinumab in South Korea from January 2012 to December 2018.
TB, Tuberculosis.
*Sum of the duration of ustekinumab treatment and 120 days after the date of last treatment.
†Based on the 2016 annual report from the Korea Centers for Disease Control and Prevention.

However, South Korea has a higher tuberculosis burden than other developed countries.[4]

We used the National Health Insurance Service database to select patients who were administered ustekinumab from January 2012 to December 2018. Age- and sex-specific incidence of tuberculosis in the general Korean population was referenced from the 2016 annual report on notified tuberculosis in Korea by the Korea Centers for Disease Control and Prevention.[4] Patients with active tuberculosis were defined as individuals prescribed triple or quadruple antituberculosis treatment with *International Statistical Classification of Diseases and Related Health Problems, 10th Revision* diagnosis codes of tuberculosis (Supplemental Table I; available at https://doi.org/10.17632/2ry49gwzcr.1). Active tuberculosis related to ustekinumab was defined as active tuberculosis infection after the first index date of ustekinumab treatment or within 120 days after the last ustekinumab treatment (Fig 1). Standardized incidence ratios of active tuberculosis in ustekinumab-treated patients were calculated to compare the tuberculosis incidence in the general Korean population.

A total of 2803 patients treated with ustekinumab were identified from the database from January 2012 to December 2018 (Table I). The mean duration of ustekinumab treatment was 691.1 days (standard deviation 647.2 days; median 450 days; interquartile range 130-1085 days). All patients were treated with ustekinumab under the diagnosis of psoriasis or psoriatic arthritis, except for 9 patients (0.3%) who had Crohn's disease. Eleven patients (0.4%) with active tuberculosis, of whom 6 had active tuberculosis before initiation of ustekinumab treatment, and 2 who developed active tuberculosis

more than 120 days after the last ustekinumab treatment were excluded. Finally, 3 patients were considered to have active tuberculosis related to ustekinumab treatment. The duration of ustekinumab treatment before diagnosis of active tuberculosis in these 3 patients was 53, 1046, and 1280 days (Supplemental Table II). There was neither active nor latent tuberculosis within 3 years before first ustekinumab treatment in these 3 patients. Sex- and age-adjusted expected number of active tuberculosis cases from 2803 patients was 3.945; thus, the standardized incidence ratio was 0.76 compared with that in the general population (95% confidence interval 0.59-2.02).

This study showed that ustekinumab did not increase the risk of tuberculosis compared with that among the general population in an actual clinical setting in South Korea. Similarly, Hsiao et al[5] reported no active tuberculosis infection in 134 psoriatic patients receiving ustekinumab in Taiwan. Thus, these results suggest that ustekinumab treatment does not require additional tuberculosis monitoring even in areas with high disease burden. Further studies from other regions are needed to validate these results.

This study was supported by the National Health Insurance Service (NHIS) in Korea. NHIS helped us to access and analyze the National Health Insurance Database.

Soo Ick Cho, MD,[a] Sungchan Kang, MS,[b] Ye Eun Kim, MD,[a] Jin Yong Lee, MD, PhD, MHA,[c,d] and Seong Jin Jo, MD, PhD[a]

From the Department of Dermatology,[a] Graduate School of Public Health,[b] and Department of Health Policy and Management,[d] Seoul National University College of Medicine, Seoul, South Korea; and Department of Public Health and Community Medicine, Seoul Metropolitan Government—Seoul National University Boramae Medical Center, Seoul, South Korea.[c]

Drs Lee and Jo contributed equally to this article.

Funding sources: None.

Conflicts of interest: None disclosed.

IRB approval status: Reviewed and approved by the SMG-SNU Boramae Medical Center IRB, Seoul, South Korea (07-2019-21/082).

Reprints not available from the authors.

Correspondence to: Jin Yong Lee, MD, PhD, MHA, Department of Public Health and Community Medicine, Seoul Metropolitan Government—Seoul National University Boramae Medical Center, 20 Boramae-Ro 5gil, Dongjak-Gu, Seoul 07061, Korea

E-mail: jylee2000@gmail.com

Correspondence to: Seong Jin Jo, MD, PhD, Department of Dermatology, Seoul National University College of Medicine, 101 Daehak-ro, Jongno-gu, 03080, Seoul, Korea

E-mail: sj.jo@snu.ac.kr

REFERENCES

1. Menter A, Strober BE, Kaplan DH, et al. Joint AAD-NPF guidelines of care for the management and treatment of psoriasis with biologics. *J Am Acad Dermatol*. 2019;80(4):1029-1072.
2. Tsai TF, Ho V, Song M, et al. The safety of ustekinumab treatment in patients with moderate-to-severe psoriasis and latent tuberculosis infection. *Br J Dermatol*. 2012;167(5):1145-1152.
3. Lee JY, Kang S, Park JS, Jo SJ. Prevalence of psoriasis in Korea: a population-based epidemiological study using the Korean National Health Insurance Database. *Ann Dermatol*. 2017;29(6):761-767.
4. Cho KS. Tuberculosis control in the Republic of Korea. *Epidemiol Health*. 2018;40:e2018036.
5. Hsiao CY, Chiu HY, Wang TS, Tsai TF. Serial QuantiFERON-TB Gold testing in patients with psoriasis treated with ustekinumab. *PLoS One*. 2017;12(9):e0184178.

https://doi.org/10.1016/j.jaad.2019.12.033

Cocamidopropyl betaine is commonly found in hypoallergenic personal care products for children

To the Editor: Atopic dermatitis (AD), found in approximately 15% of pediatric patients in the United States, is an inflammatory skin condition associated with poor skin barrier function, resulting in significantly higher rates of cutaneous delayed-type hypersensitivity and allergic contact dermatitis (ACD) compared with populations without AD,[1] particularly to weaker allergens.[2]

In 2014, Shaughnessy et al[1] analyzed 1674 patients with and without AD who underwent patch testing with the North American Contact Dermatitis Group patch series for reactivity to surfactants, products known to worsen skin barrier dysfunction and aggravate skin inflammation in patients with ACD and AD. Their study determined an association between cocamidopropyl betaine (CAPB) contact sensitivity and a history of AD and concluded that children with AD should not be exposed to CAPB.[1] These results are supported by our recent study of a pediatric cohort wherein all CAPB reactions came exclusively from patients with AD.[3]

Despite being the allergen with the eighth most frequent reactions in a recent 10-year retrospective medical record review of pediatric patients,