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Diagnosis of stress-associated dermatologic conditions in New York City safety-net hospitals during the COVID-19 pandemic

To the Editor: As discussed by Pathoulas et al,[1] neurocutaneous conditions triggered or aggravated by stress, such as skin picking and hair pulling, were significantly exacerbated during the COVID-19 pandemic. Reportedly, presentations of shingles, psoriasis, and eczema, conditions that are also precipitated or impacted by stress, have increased similarly during the pandemic.[2-4] Nonetheless, real-world data demonstrating the frequency of diagnosis of such disorders are notably lacking. Low-income minority populations have been disproportionately affected by stress related to SARS-CoV-2 because of a higher prevalence of infection, morbidity, mortality, and economic instability.[5] Here, we investigate the rate of diagnosis of stress-associated dermatologic conditions from a large safety-net hospital system in New York City during the pandemic.

Patients with any 1 of 8 diagnoses (7 stress-associated and 1 control) were extracted from a combined patient volume (23,757 prepandemic and 26,213 pandemic) treated by the dermatology departments of the New York City Health and Hospitals System. Inpatient consults were not included. The rate of diagnosis of each condition was compared between the prepandemic (June 1, 2019, to March 1, 2020) and pandemic (June 1, 2020, to March 1, 2021) periods. Cases were additionally filtered by COVID-19 positivity, as defined by a diagnosis of COVID-19 and/or laboratory evidence of infection by polymerase chain reaction or serology in the electronic medical record (EPIC Systems) during the study period. Deidentified, aggregated data were obtained (Slicer/Dicer, EPIC Systems).

Of the 8 diagnoses analyzed, the prevalence of only 2 increased during the pandemic: acne, by 15% ($P < .0001$), and telogen effluvium, by 166% ($P < .0001$) (Fig 1). The same conditions were then examined among patients with COVID-19 (Fig 2). In the cohort of patients with COVID-19, the majority of stress-related conditions had significantly increased: acne (54%, $P < .01$), telogen effluvium (266%, $P < .01$), urticaria (111%, $P < .01$), and herpes zoster (250%, $P < .01$). Diagnoses of tinea pedis (not considered to be stress-associated) had also markedly increased in this subset of patients.

The arrival of COVID-19 engendered a unique environment presumed to trigger the expression of disorders with known links to stress.[1-4] Unexpectedly, diagnoses long held to be provoked or exacerbated by stress (eg, herpes zoster, psoriasis, urticaria, etc) were unaffected, even in a population heavily impacted by the pandemic.[5] Only the prevalence of telogen effluvium and acne (likely due to mask-wearing) had increased.

Conversely, the frequency of most stress-related diagnoses was elevated in patients with COVID-19. This could suggest that the physiologic stress of infection weakened immunologic defenses, enabling the expression of underlying cutaneous disease. Alternatively, it is likely that patients with COVID-19 were more carefully scrutinized, resulting in the increased identification of dermatologic disorders in this group. This potential for selection bias along with the possibility that patients with minor disease flares or severe stress did not present to dermatology clinics and the likelihood of changes in health-seeking behavior during the pandemic all constitute study limitations.

Although "stress" is a commonly implicated culprit in flares of psoriasis or outbreaks of shingles, the influence of this response on a given disease state is exceedingly difficult to quantify, and hard data are markedly lacking. Nevertheless, these results suggest that empirical research is truly needed to better understand the complex interplay between stress and cutaneous pathology.

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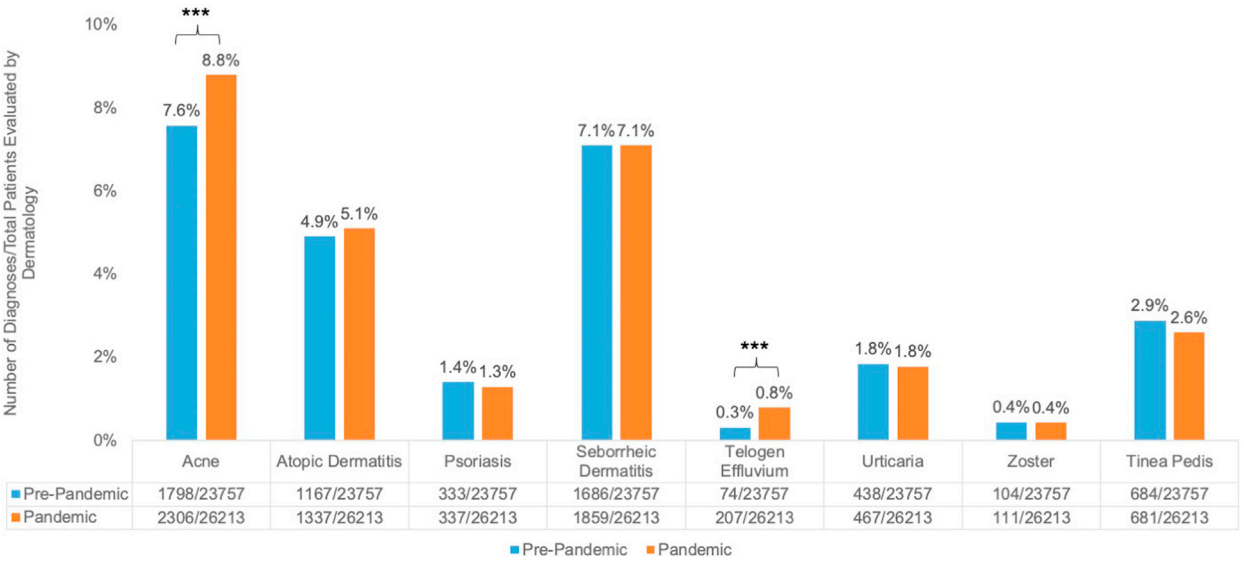

Fig 1. Stress-associated diagnoses. Prepandemic was measured from June 1, 2019, to March 1, 2020. Pandemic was measured from June 1, 2020, to March 1, 2021. Diagnoses of acne and telogen effluvium increased during the pandemic. The *three asterisks* denote statistical significance ($P < .001$) as calculated by a χ^2 test. The table in the figure displays the number of diagnoses per the total number of patients evaluated by dermatology. Clinic sites included Woodhull, Cumberland, Kings County, Elmhurst, Lincoln, Jacobi, Coney Island, North Central Bronx, Queens, Metropolitan, Bellevue, and Gouverneur.

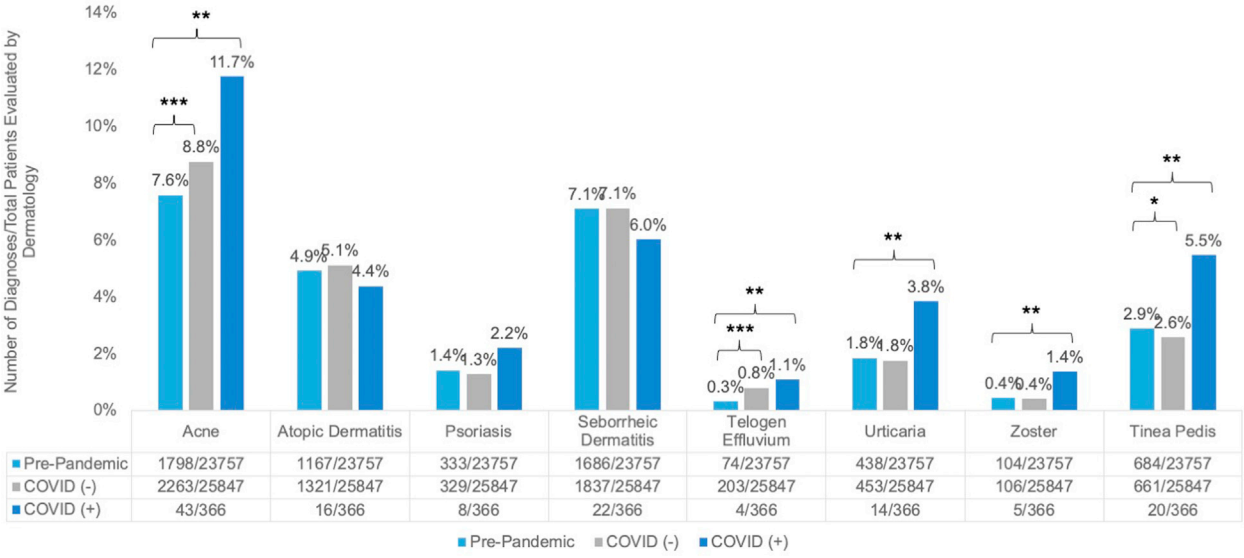

Fig 2. Stress-associated diagnoses in patients with COVID-19. Prepandemic was measured from June 1, 2019 to March 1, 2020. Pandemic was measured from June 1, 2020, to March 1, 2021. The COVID-19–positive cohort includes patients that had a diagnosis of COVID-19 and/or tested positive for the virus by polymerase chain reaction or serology. The COVID-19–negative cohort includes patients that tested negative or had no test result in the system. Diagnoses of acne, telogen effluvium, urticaria, herpes zoster, and tinea pedis were increased in the COVID-19–positive cohort. Diagnoses of acne and telogen effluvium were increased in the COVID-19–negative cohort. The *three asterisks* denote statistical significance ($P < .001$), the *two asterisks* denote statistical significance ($P < .01$), and the *single asterisk* denotes statistical significance ($P < .05$) as calculated by a χ^2 test. The table in the figure displays the number of diagnoses per the total number of patients evaluated by dermatology.

Conflicts of interest

None disclosed.

REFERENCES

1. Pathoulas JT, Olson SJ, Idnani A, Farah RS, Hordinsky MK, Widge AS. Cross-sectional survey examining skin picking and hair pulling disorders during the COVID-19 pandemic. *J Am Acad Dermatol*. 2021;84(3):771-773.
2. Evans A. Stress and the skin: mechanisms underlying the brain-skin connection. *MedPage Today*. 2020. Accessed December 9, 2020. https://www.medpagetoday.com/reading-room/aad/general-dermatology/90096
3. Zara A, Fleming P, Lee K, Lynde C. The COVID-19 pandemic and its skin effects. *Can Fam Physician*. 2021;67(8):582-587. https://doi.org/10.46747/cfp.6708582
4. Grey H. What the pandemic has taught us about stress and psoriasis. Medical News Today. Accessed July 8, 2021. https://www.medicalnewstoday.com/articles/what-the-pandemic-has-taught-us-about-stress-psoriasis
5. McKnight-Eily LR, Okoro CA, Strine TW, et al. Racial and ethnic disparities in the prevalence of stress and worry, mental health conditions, and increased substance use among adults during the COVID-19 pandemic—United States, April and May 2020. *MMWR Morb Mortal Wkly Rep*. 2021;70(5):162-166.

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