

dermal cysts after the presentation of herpes zoster which had occurred 1 year prior⁵.

Various hypotheses about the pathogenesis of the epidermal cyst and milia exist. Physical damage and histological inflammation of the skin by herpes zoster and bulbous disorders may induce the epidermal cyst and milia. In particular, the use of immunosuppressive drugs may contribute to the development of a cyst more easily by exacerbating the inflammation imbalance and pilosebaceous unit occlusion.

Our case is the second case of an epidermal cyst caused by Wolf's post-herpetic isotopic response, but it is the first case that occurred during a short period in a healthy adult without using of immunosuppressive agents.

The incidence of herpes zoster is increasing every year with an increased lifespan and the use of various immunosuppressive agents. Considering these tendencies, it is also assumed that the isotopic response caused by the herpes zoster would also increase. Based on this case, physicians should keep in mind that multiple epidermal cysts could occur from Wolf's post-herpetic isotopic response in healthy adults.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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<https://doi.org/10.5021/ad.2018.30.6.739>



Rosacea and Rate of Temperature Change: Examining Real-Time Data from 2004 to 2016

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Dear Editor:

Rosacea is a chronic inflammatory skin condition with exacerbations that may be triggered by heat¹. However,

there is limited data on seasonal variations of rosacea exacerbations. In this study we use real-time Google Trends data to examine seasonal variations in rosacea search quer-

Received September 8, 2017, Accepted for publication January 5, 2018

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ies in the United States (US) and United Kingdom (UK) and its relation to seasonal temperature variations.

Google Trends (<https://www.google.com/trends/>) is a resource that provides normalized search volume data for terms queried using Google. This technology has recently gained attention in dermatology to assess prevalence of tanning bed use and skin cancer in the US and the UK².

Monthly data for search volume in the US and UK was extracted from January 2004 to March 2016. Search volume

data is represented by a relative search volume index (SVI), which ranges from 0 (no searches) to 100 (peak search volume) relative to all searches on the topic. US national temperature data by month was obtained from the National Oceanic and Atmospheric Administration³, and for the UK from the Met Office, the UK's national weather service⁴. The monthly SVI for "rosacea" queries and temperature data over time for the US is plotted in Fig. 1 and for the UK in Fig. 2. There is a clear and reliable trend, where

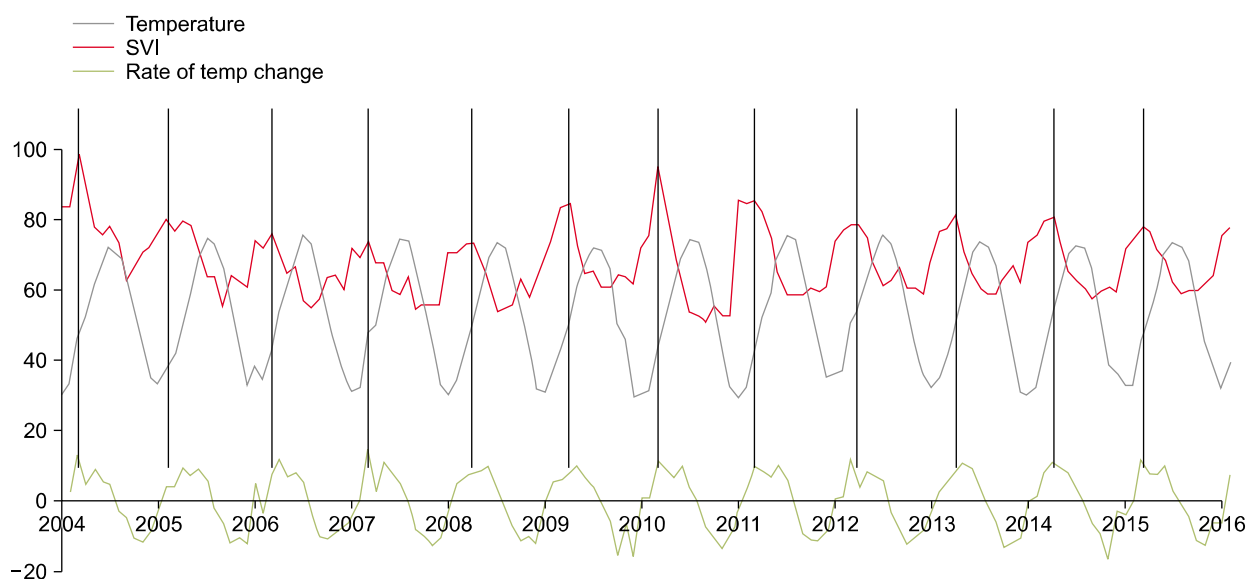


Fig. 1. Search volume index (SVI) for "rosacea", national temperature (°F), and rate of temperature change in the United States by month from January 2004 to March 2016. Black vertical lines are drawn from the peak of rosacea SVI each year and correspond well to the rate of temperature change peaks.

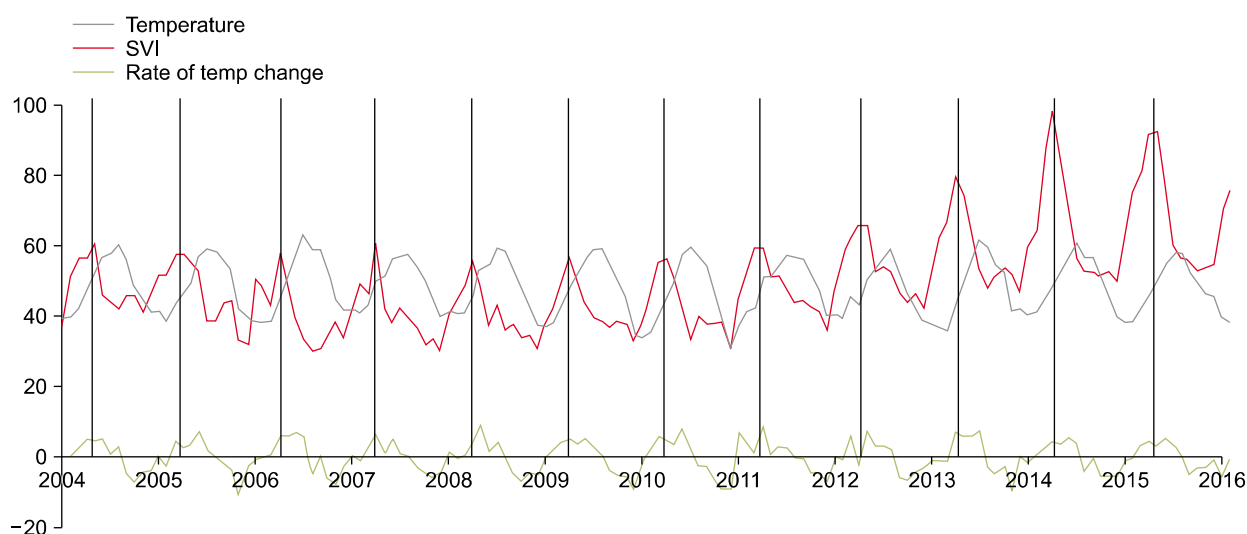


Fig. 2. Search volume index (SVI) for "rosacea", national temperature (°F), and rate of temperature change in the United Kingdom by month from January 2004 to March 2016. Black vertical lines are drawn from the peak of rosacea SVI each year and correspond well to the rate of temperature change peaks.

search queries for rosacea peak in March-April and temperatures peak in July-August each year. We determined the rate of temperature change of each month to highlight the times at which the temperature fluctuated most rapidly. There was a significant Pearson's correlation in the US ($r=0.57$, $p=1.02 \times 10^{-13}$) and UK ($r=0.43$, $p=4.78 \times 10^{-8}$) for "rosacea" SVI and the velocity of temperature change, indicating a positive relationship: the faster the temperature changes, the more searches for rosacea (for this data, the critical value for the Pearson correlation at a significance of $p=0.05$ is 0.17, indicating correlations >0.17 are significant).

Our data suggest that abrupt changes in temperature lead to more rosacea interest and potentially a greater number of exacerbations. This interpretation is based on the assumption that increased rosacea interest, as evidenced by search queries, may be a surrogate measure of increased rosacea disease activity in the public.

There are many factors that might explain this observation. Patients with rosacea have higher cutaneous blood flow, increased diaphoretic events, and heightened sympathetic nerve activity during heating as compared to healthy controls¹. This suggests that sympathetic hyperactivity during heating contributes to flushing and other rosacea symptoms. Furthermore, epidemiological investigations have demonstrated a close association between *Demodex* mite infestation and rosacea⁵. *Demodex* mite mobility and survival increases at higher temperatures, contributing to increased rosacea exacerbations as temperatures increase⁵. These findings should be interpreted with caution, as our results are restricted to Google search engine data. Nonetheless, Google Trends is a powerful tool that pro-

vides real-time, immediate, and free temporal data. We show that seasonal variations in temperature correlate with rosacea search volume. With refinery, this technology can contribute significantly to epidemiological research and be used to detect potential seasonal variations in less commonly studied dermatological conditions.

CONFLICT OF INTEREST

The authors have nothing to disclose.

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