

- 7 Rodriguez-Jimenez R, Chicharro P, De Argilia D *et al.* Urticaria-like lesions in COVID-19 patients are not really urticaria – a case with clinico-pathological correlation. *J Eur Acad Dermatol Venereol* 2020; **34**: e459–e460.
- 8 Xu R, Zhou Y, Cai L *et al.* Co-reactivation of human herpesvirus alpha subfamily (HSV 1 and VZV) in critically III patient with COVID-19. *Br J Dermatol* 2020; **183**: 1145–1147.
- 9 Ramirez E, Urroz M, Rodríguez A *et al.* Suspected serious adverse reactions in hospitalized COVID-19 patients. Preprints 2020 August 12; <https://doi.org/10.20944/preprints202008.0283.v1>
- 10 Hayakawa J, Takakura H, Mizukawa Y, Shiohara T. COVID-19-related cutaneous manifestations associated with multiple drug sensitization as shown by lymphocyte transformation test. *J Eur Acad Dermatol Venereol* 2020; **34**: e779–e781.

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## Why are chilblains underreported in Nordic countries during the COVID-19 pandemic? An analysis of Google Trends

Dear Editor,

An unusual number of cases of chilblains has mainly been reported in Southern Europe (Italy, Spain, France).<sup>1</sup> and in the United States<sup>2</sup> during the COVID-19 pandemic. However, the link of causality between those two events remains debated.<sup>3,4</sup> Herman *et al.*<sup>4</sup> suggested that confinement and lockdown restrictions with decreased physical activity, increased time spent in sedentary positions, use of recreation drugs and remaining barefoot or in socks at home may be related to the symptoms. In Northern Europe, Finland (7871 declared cases on 23 August 2020) and Norway (10 197) suffered less infections than Sweden (86 068).<sup>5</sup> As confinement has not been applied in Nordic countries, it is of interest to know whether there has also been an increase of chilblains cases in those countries. To our knowledge, there are no reports published thus far. We used Google Trends (GT) to investigate whether there were notable variations in searching for information related to chilblains, before and during the COVID-19 pandemic, between Northern and Southern Europe.

We analysed the data generated through GT for relative search volumes (RSV) of the word ‘chilblains [disease]’, worldwide and in six countries (Italy, Spain, France, Norway, Finland, Sweden) from 1 January 2016 to 23 August 2020. We also evaluated RSV for ‘COVID toes’. The methodology has been described in a previous study.<sup>6</sup>

Worldwide searches for ‘chilblains’ display a striking regularity with yearly peaks in January/February. Smaller but regular

peaks occur also every July and match searches from the Southern Hemisphere during austral winter (Fig. 1a). The peak in January 2020 was less high compared to previous years, possibly because of exceptional warm temperatures this winter.<sup>7</sup> Two additional peaks occurred around April/May 2020 and July 2020. The pattern in Italy and in Spain is strikingly similar with notable peaks every December/January and almost no search the rest of the year. A resumption in April and May 2020 is notable. France displayed a similar pattern, although a background noise of searches occurs also in springs (Fig. 1b). In Nordic countries, winter peaks are notable too; however, the patterns are not as clear-cut as for Italy and Spain. Peaks in April and May 2020 are also visible in Norway and Sweden (Fig. 1c). Peaks in May and July 2020 usually matched with ‘COVID toes’ searches (*data not shown*).

There may be several reasons for the paucity of reports of chilblains in Nordic countries: low prevalence of infection in the general population compared to other countries, low prevalence of infection among the young,<sup>8</sup> underreporting of cases and failure to consult for symptoms that are not severe. The search peaks in spring 2020 may be related to patients with symptoms and indicate that the same symptoms occurred elsewhere in Europe. However, peaks matched also ‘COVID toes’ key word, so we cannot rule out an artificial increase of searches on Google and other Web search engines in relation to news coverage over the Internet of this new phenomenon.

To conclude, Nordic countries have not imposed strict confinement to population as in Southern Europe and there are currently no reports of chilblains ‘outbreaks’ during this period. This could indirectly point towards a link between confinement and chilblains. However, there have been searches for ‘chilblains’ in Spring 2020 on GT in northern Europe. Nordic dermatologists should gather and report their cases of chilblains during the COVID-19 pandemic, so we could evaluate whether chilblains are a global phenomenon that occurred in countries that did not confine as well.

### Conflict of interest

None.

### Financial sources

None.

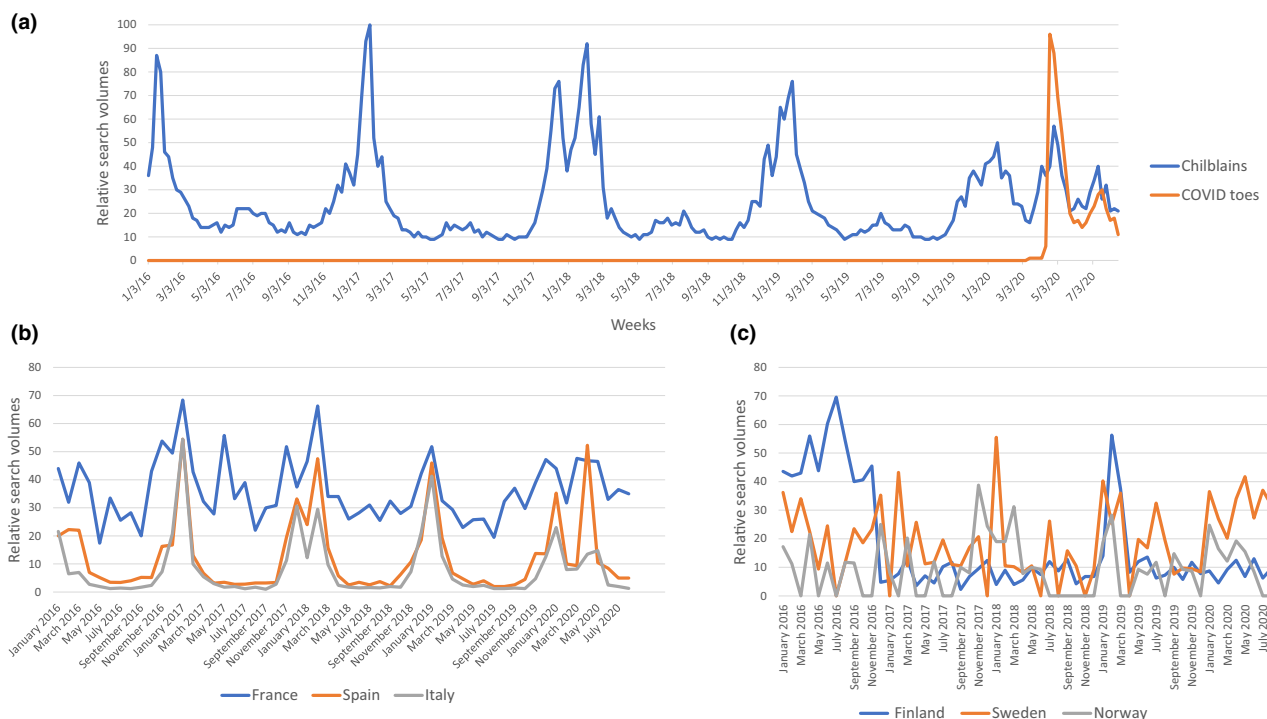
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### References

- 1 Galván Casas C, Català A, Carretero Hernández G *et al.* Classification of the cutaneous manifestations of COVID-19: a rapid prospective nationwide consensus study in Spain with 375 cases. *Br J Dermatol* 2020; **183**: 71–77.



**Figure 1** (a) Relative search volume indexes on Google Trends for ‘chilblains’ and ‘COVID toes’, worldwide, between January 2016 and August 2020. Direct comparison of RSV between both terms is not possible. (b) Monthly mean values for relative search volume indexes on Google Trends for ‘chilblains’, for France, Italy and Spain between January 2016 and August 2020. Direct comparison of RSV between countries is not possible, and only trends should be compared. (c) Monthly mean values for relative search volume indexes on Google Trends for ‘chilblains’, for Finland, Norway and Sweden, between January 2016 and August 2020. Direct comparison of RSV between countries is not possible, and only trends should be compared.

- Freeman EE, McMahon DE, Lipoff JB *et al.* American Academy of Dermatology Ad Hoc Task Force on COVID-19. pernio-like skin lesions associated with covid-19: a case series of 318 patients from 8 countries. *J Am Acad Dermatol* 2020; **83**: 486–492.
- Herman A, Peeters C, Verroken A *et al.* Evaluation of chilblains as a manifestation of the COVID-19 Pandemic. *JAMA Dermatol* 2020; **156**: 998–1003. <https://doi.org/10.1001/jamadermatol.2020.2368>
- Hébert V, Duval-Modeste AB, Joly P *et al.* Lack of association between chilblains outbreak and SARS-CoV-2: histological and serological findings from a new immunoassay [published online ahead of print, 2020]. *J Am Acad Dermatol* 2020; **83**: 1434–1436. <https://doi.org/10.1016/j.jaad.2020.07.048>
- WHO Coronavirus Disease (COVID-19) Dashboard. URL <https://covid19.who.int> (last accessed: 23 Aug 2020).
- Kluger N, Scrivener JN. The use of Google Trends for acral symptoms during COVID-19 outbreak in France. *J Eur Acad Dermatol Venereol* 2020; **34**: e358–e360.
- Copernicus Climate Change Service. Surface air temperature for January 2020. URL <https://climate.copernicus.eu/surface-air-temperature-january-2020> (last accessed: 24 Aug 2020).
- Størdal K, Bakken IJ, Greve-Isdahl M *et al.* SARS-CoV-2 in children and adolescents in Norway: confirmed infection, hospitalisations and underlying conditions. *Tidsskr Nor Laegeforen* 2020; **140**. <https://doi.org/10.4045/tidsskr.20.0457>

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## Clinical symptoms of hyperandrogenic women diagnosed with COVID-19

To the Editor

The mortality rate of COVID-19 has been observed to be higher in males than in females internationally.<sup>1</sup> In humans, the only known promoter of the *TM6SS2* gene is an androgen response element;<sup>2,3</sup> therefore, androgens could potentially explain the sexual dimorphism observed in COVID-19 disease burden.<sup>4</sup>

Female hyperandrogenism is characterized by elevated androgen levels and is often a result of polycystic ovary syndrome (PCOS). It plays a role in the development of acne, hirsutism and female pattern hair loss.<sup>5</sup> Thus, we hypothesized that women suffering from hyperandrogenism may face an elevated risk of severe COVID-19 symptoms.

A cross-sectional case–control analysis was conducted to measure incidence of clinical characteristics of COVID-19 in hyperandrogenic women. Subjects presented with symptoms of