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GUEST EDITORIAL

Digital epidemiology, biological rhythms, and headache disorders

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The way people communicate has significantly changed over time with the global use of the internet and mobile devices. A growing body of data has been generated outside the healthcare environment making digital epidemiology an exciting new avenue of research in medicine. Digital data sources can potentially be used to assess real-time disease dynamics in populations worldwide, but methodological issues are considerably challenging.[1]

Various successful attempts have been performed using search engine query data trends and its main database Google Trends for prediction of several infectious disease outbreaks,[2] as there are some reports of unsuccessful ones.[3] Although digital epidemiology seems promising for monitoring outbreaks, significant contributions can be achieved in non-communicable chronic diseases, including headache disorders.[4]

The paper entitled "Seasonal changes of internet searching suggest circannual rhythmicity of primary headache disorders" by Radziwon and Waszak.[5] published in this journal edition brings an interesting example of how digital epidemiology can shed light into biological mechanisms.

The data extracted from the Google Trends database from 2010 to 2019 in 31 European countries search queries for the words headache, migraine, tension-type headache, and cluster headache were analyzed. The authors aimed at finding a difference in internet searches along the year as a marker for circannual variation in headache disorders. An increase during spring and autumn seasons was found for the topics of headache and migraine but not for tension-type and cluster headache. The obvious rhythmicity found in cluster headache could not be captured by this tool due to the low volume of searches.

The influence of the hypothalamus, the biological clock (suprachiasmatic nuclei), and melatonin secretion by the pineal gland are well-known in headache disorders.[6] The new methodologic approach brought by digital epidemiology not only supports this knowledge, but shows to the scientific community the potential use of such a tool.

The use of digital epidemiology assessing seasonal variation in headache disorders has been done by Swerts et al.[7] where the link between headaches and rhinitis could be acknowledged. Other digital data from social media, including YouTube, Twitter, Facebook, has been the source for studies in headache disorders.[8]

Methodological limitations of search engine query data analysis still need a solution, including the impact of low search volume, representativeness, validity of terms, language, filtering, and classification.

CONFLICT OF INTEREST

The author reports no relevant conflict of interest.

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