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A Trend Study of Gout Prevalence in Different Tropical Climate Zones

TREO Talk Paper

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Abstract

Gout, also known as gouty arthritis, is a chronic disease that often occurs alongside tophi, kidney stone, acute uric acid nephropathy, and other complications. The primary cause of gout is an abnormality of uric acid metabolism, which can have either non-modifiable or modifiable risk factors. The non-modifiable factors are hereditary (e.g., gender and race), which are not discussed in this study. The modifiable factors are caused by environmental factors such as climate, diet, kidney or organ transplants, medication (e.g., aspirin), and other lifestyles (Kuo et al., 2015). Among the modifiable causes, climate and diet factors are very common. Specifically, the climatic factors that can trigger gout have been identified as temperature and humidity. Lower temperatures affect the solubility of uric acid crystals, causing them to settle; conversely, higher temperatures cause sweating, even dehydration and metabolic acidosis (Neogi et al., 2014). Countries and cities in different climate zones have different temperatures and humidity levels and therefore different gout prevalence. This study explores the pattern of change in gout and gout-related Internet search volume over time for certain cities and countries located in different climate zones. It also explores the relationships between the actual climate data (temperature and humidity) of certain countries and cities and the volume of gout information searched in different climate zones.

Nowadays, the Internet is the main source of information for those who suffer from gout and provides a large amount of gout-related information, which helps reduce the prevalence of the disease (Jordan et al., 2018). The current study uses Google's keyword trend analysis tool (Google Trends) to understand how Internet users or gout patients actively seek out gout-related information online. Analyses were conducted on the keyword *gout* (or its counterpart in the primary language of each region) and the relevant keywords (e.g., *arthritis*, *uric acid*). The search was confined within the *health* category. The time frame was set between January 1, 2009, and December 31, 2018. The regions were set to match the authors' interests in tropical climate zones: Singapore City, Singapore (tropical rain forest); New Delhi, India (tropical monsoon); Taipei City, Taiwan (subtropical). This study also collected regional temperature and humidity data from the publicly accessible website (<https://www.worldweatheronline.com>) and used the temperature and humidity data as a proxy of prevalence, a practice that is well supported by prior research (Neogi et al., 2014). Then, the average monthly temperature and humidity data were compared with the search volume of gout and that of its relevant keywords by carrying out several correlation analyses. Ultimately, this study expects to predict the periods when gout is more prevalent in order to give medical professionals more updated and valid information and to serve as a reference for understanding the disease for medical diagnostic purposes.

References

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