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Short communication

COVID-19 Epidemic: Chloroquine, a French Obsession?

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Introduction. – One potential COVID-19 treatment, hydroxychloroquine has been the focus of much debate since its first publication by a French research team. To an unusual degree, this debate has extended outside of the medical community into the public sphere.

Objective. – To know if this interest, which conceals the reality of scientific debate, occurred worldwide.

Methods. – Methodological use of the Google-Trends was standardized. We researched the web queries for “hydroxychloroquine” and “chloroquine” and “amoxicillin” and “acetaminophen” as reference. Analysis was detailed by country. The relationship between these queries and the COVID-19 epidemic was supported by analysis of the main “related queries”. Google-Trends provided results on a relative value basis, on a scale from 0 to 100, with a value of 100 indicating the most researched criterion over the study period.

Results. – Web queries for “amoxicillin” never exceeded the value of 1. Searches for “acetaminophen” peaked on March 13 with a value of 13. “Hydroxychloroquine” was the most frequently researched term. It reached its peak value of 99 on April 7. Queries for “chloroquine” peaked (value 100) on March 24. Searches for “hydroxychloroquine” came essentially from Asia and the United States, with France in 22nd position (value of 21). Searches for “chloroquine” came essentially from Africa, with France in 8th position (value of 55). The five main related searches were in both cases associated with the COVID-19 epidemic.

Conclusion. – Interest in chloroquine is not specific to France. Results of ongoing studies have been and will be scrutinized attentively in all corners of the globe.

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Introduction

As we observe COVID-19 associated mortality, our attention is focused on potential treatments [1]. A recent review identified over ten medications currently being evaluated [2]. One potential treatment, the association of hydroxychloroquine and azithromycin has been the focus of much debate since its publication by a French research team [3]. To an unusual degree, this debate has extended outside of the medical and scientific community into the public sphere [4,5]. Such lively debate strongly contributed to trouble the discussion on COVID-19 treatments. First, because it contributed to increase the number of (not always indispensable) researches and publications dedicated to hydroxychloroquine and/or chloroquine. Second, because some relevant discussions on COVID-19 epidemic have been omitted due to the preeminent place accorded to this debate in the media. Third, because it contributed not only to disturb the medical community, but also the physicians-to-patients relation, as some of the latter were demanding this controversial treatment. And finally, because the risk of side-effects related to chloroquine and/or hydroxychloroquine, particularly in association with other drugs, cannot be excluded. We wanted to know if this interest expressed by the public, which conceals the reality of scientific debate, occurred exclusively in France. To answer this question objectively, we used the tool Google Trends®, which analyses trends in web queries.

Methods

Methodological use of the Google Trends was standardized [6]. We used “hydroxychloroquine” and “chloroquine” as query keywords. We added the terms “amoxicillin” and “acetaminophen”.

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both among the most prescribed drugs worldwide. They served as reference. Analysis was detailed by country. In order to have a timeframe that included a baseline as well as the COVID-19 epidemic, the analysis period of three months was done from January 1, 2020, to April 20, 2020. The relationship between this research and the COVID-19 epidemic was supported by the analysis of the main related queries. Google Trends provided results on a relative value basis, on a scale from 0 to 100, with a value of 100 indicating the most researched criterion over the study period. The analysis was conducted on April 20, 2020.

Results

Web queries for “amoxicillin” never exceeded the value of 1. Those for “acetaminophen” peaked on March 13 with a value of 13 (figure 1). “Hydroxychloroquine” was the most frequent query (figure 1). It reached its peak value of 99 on April 7 (second peak, figure 1), while that of “chloroquine” peaked (value 100) on March 24 (first peak – figure 1).

The main related queries associated with the first peak were queries on “hydroxychloroquine” and/or “chloroquine” and/or “azithromycin” (6/10). The main related queries associated to the second peak were queries on Acharya Prasobha Chandra Ray (a chemist from India who was believed to have discovered hydroxychloroquine) and the companies producing hydroxychloroquine (7/10), most of them coming from India [7].

Queries for “hydroxychloroquine” occurred essentially from Asia and the United States of America (table I - Appendix), with France in 22nd position (value of 21). Queries for “chloroquine” came essentially from Africa (table I - Appendix), with France in 8th position (value of 55). The five queries most frequently related to “hydroxychloroquine” and “chloroquine” queries, were also related to the COVID-19 epidemic (in fact, this was true for the 20 first related queries - results not presented) (table I - Appendix).

Discussion

There was a worldwide interest for hydroxychloroquine and chloroquine. Comparison with queries for acetaminophen and amoxicillin gives us an idea of the amplitude of this web query phenomenon. The surge of interest that began at the end of February and coincides with the declaration and the spread of the COVID-19 epidemic leaves little doubt as to its cause [2]. The first peak related to a global interest for hydroxychloroquine/chloroquine in COVID-19 epidemic was likely due to the French first publications [1]. The second peak (hydroxychloroquine, April 7th) can be explained by the recommendation of the use of hydroxychloroquine as a prophylaxis in India, as emphasized in specifically related researches [7,8].

There is a strong geographic disparity in query trends. Users in the United States and Asia predominantly interrogated on hydroxychloroquine, while those in African countries did preferentially on chloroquine. This can be explained by the long history of sustained use of chloroquine as an anti-malarial drug of reference in this part of the world [9]. It appears that debates on the therapeutic value of both compounds had more than ventured out of the scientific arena. Many studies have been conducted, but controversies remained virulent in many countries, like in the United-States [10]. Such debate, largely widespread out of the field of science and medicine, probably contributes to science distrust with deleterious consequences in the perspective of the upcoming vaccine campaign [11,12].

Conclusion

Interest for chloroquine is not specific to France. Notwithstanding the particular attention drawn to chloroquine in France due to the highly mediatised work of a team in Marseille, interest is global. Results of ongoing studies will be scrutinized attentively in all corners of the globe.

Informed consent and patient details

the authors declare that the work described does not involve patients or volunteers.

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Author contributions

all authors attest that they meet the current International Committee of Medical Journal Editors (ICMJE) criteria for Authorship.
Disclosure of interest

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the other authors declare that they have no competing interest.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.lpmope.2021.100007.

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