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Review

Hypertension and Migraine: A Bibliometric Analysis

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Introduction
Hypertension, or high blood pressure, is a common and serious health issue. It has no specific symptoms, and for that, it is called the silent killer. Migraine attacks may be alarming for those with hypertension.

Objective
This review aims to analyze the trending publications concerning hypertension and migraine.

Methods
This bibliometric analysis analyzed the trending publications about hypertension and migraine. The Scopus database was used, and the bibliometric analysis was applied to show the most productive authors, the journals that most contributed in this field, countries, institutions, and keywords used. Hypertension and migraine showed elevated growth in the published articles throughout the years.

Results
For the last ten years, from 2013 to 2022, there has been a dramatic increase, especially in the last few years in publications related to hypertension and migraine. The highest number of publications were in the United States, the most productive authors being Dodick, D.W. and Pezzini, A., Harvard Medical School had the most published articles; and Headache journal was on the top 10 journals that had publications on this subject.

Conclusion
Migraine is recently considered a sign of hypertension, and this bibliometric analysis focused on the remarkable interest that has appeared in the research community.

Keywords:
Hypertension
Migraine
Headache
Bibliometric Analysis

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Introduction

Hypertension is considered a crucial and modifiable risk factor for many life-threatening diseases, like cardiovascular disease. It is characterized by a persistent increase in blood pressure in the systematic arteries. Blood pressure is a ratio between systolic blood pressure and diastolic blood pressure. Every updated guideline issued by several medical committees competes to decrease the limit of blood pressure, which is considered safe. Systolic blood pressure greater than 140 and diastolic blood pressure greater than 90 are considered high and need intervention. Controlling blood pressure is very vital to saving lives and preventing complications.

High blood pressure, or hypertension, has no specific symptoms. It still increases, and the body adapts to the continuous slight increase and may suddenly have serious complications. Recently, migraines, which are considered headaches in several manners, have drawn attention and been described as warning signs for having hypertension (1-3).

Methods

Study design

This research used a descriptive bibliometric analysis design to create a mapping of medical publications on hypertension and migraine. The bibliometric analysis designs were used in other papers and in many fields (4, 5). It performed by VOSviewer software, which is the most commonly used in the field of bibliometric analysis.

Data collection

The Scopus database was used as a source of data. It is generally used to perform bibliometric analyses due to the huge content of indexed journals and the Scopus tools that support that technique.

The data were extracted from the Scopus database on 18/11/2023. The search was applied through TITLE-ABS-KEY (hypertension AND migraine) AND PUBYEAR > 2012 AND PUBYEAR < 2023 AND (LIMIT-TO (SUBJAREA , "MEDI")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (EXACTKEYWORD , "Hypertension") OR LIMIT-TO (EXACTKEYWORD , "Migraine")).

The search was restricted to years from 2013 to 2022 to show the scientific mapping, with the exclusion of the current year. The search was limited to sub-area medicine. The search was also limited to article-type papers, English-language papers, and "Hypertension" and "Migraine" keywords. The produced dataset was downloaded and analyzed.

Statistical analysis

A descriptive bibliometric analysis was applied from 2013 to 2022 to show the medical mapping of hypertension and its relation to migraine, the increasing yearly number of publications, the researchers who authored in these publications, the important journals that are interested in the topic, the wide regions/countries involved in this field, and co-authorship. All of it was analyzed by using the Scopus database and VOSviewer to ensure interest in that subject.

Results

Pattern of annual publications growth

For the last 10 years from 2013 to 2022, the number of articles that were extracted from the Scopus database concerning the relation between hypertension and migraine was 1611 articles as follows: in 2013 (n = 125), 2014 (n = 115), 2015 (n = 117), 2016 (n = 108), 2017 (n = 139), 2018 (n = 112), 2019 (n = 157), 2020 (n = 184), 2021 (n = 272), and 2022 (n = 282) (Figure 1).

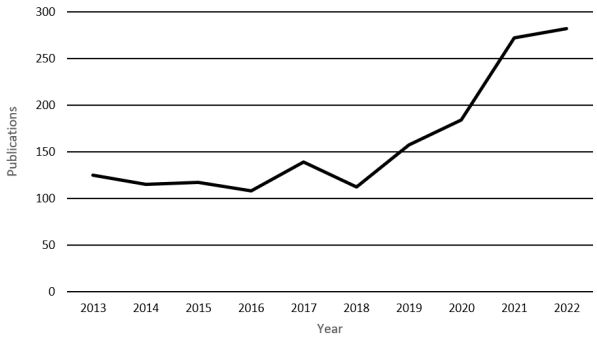

Figure 1. Annual publications of articles on hypertension and migraine

Countries

The net number of countries that published articles on hypertension and migraine is 113 (Supplementary Table 1). The largest number of publications were in the United States (622 papers), the United Kingdom (162 papers), Italy (120 papers), Canada (106 papers), Germany (95 papers), Spain (82 papers), Netherlands (74 papers), Australia (67 papers), Turkey (67 papers), and China (66 papers) (Figure 2).

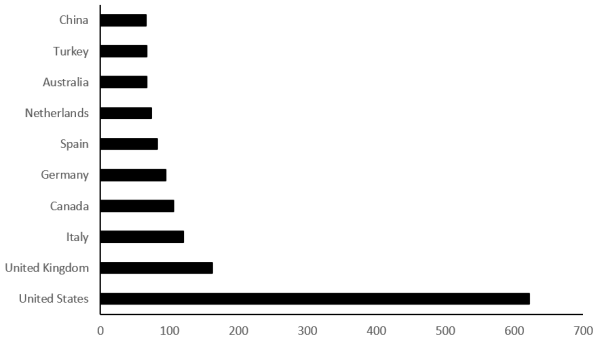

Figure 2. Top 10 countries shared articles on hypertension and migraine.

Country co-authorship

A network visualization map of country co-authorship, or international collaboration, was displayed in Figure 3 using VOSviewer. There are 46 items (countries) engaged in co-authorship in 5 clusters. Cluster 1 is formed of 15 countries (Australia, China, Hong Kong, India, Indonesia, Iran, Malaysia, New Zealand, Pakistan, Singapore, South Korea, Taiwan, Thailand, Turkey, United States). Cluster 2 is formed of 13 countries (Austria, Brazil, Finland, Germany, Greece, Ireland, Italy, Norway, Portugal, Russian Federation, Sweden, Switzerland, United Kingdom). Cluster 3 is formed of 10 countries (Belgium, Canada, Czech Republic, Egypt, Estonia, France, Israel, Netherlands, Poland, Saudi Arabia). Cluster 4 is formed of 6 countries (Argentina, Chile, Colombia, Denmark, Mexico, Spain). Cluster 5 is formed of 2 countries (Hungary, Japan). countries in every cluster shared the same color in the map, and the most co-authorship of every country shared in its cluster, but this does not prevent the presence of co-authorship between countries from different clusters.

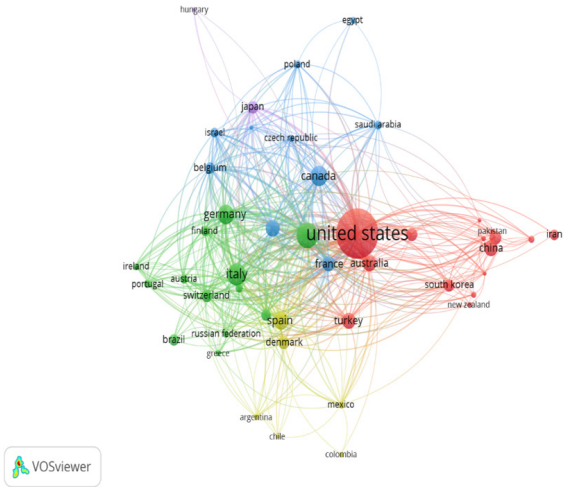

Figure 3. Country co-authorship map

Here, the country co-authorship is very surprising. While searching for the highest cited articles in the top 10 countries, the same article was the most cited article (6) in all the top 10 countries. The authors of the highest cited article were from the top 10 countries.

Authors

The overall number of authors who published articles related to hypertension and migraine is 159 (Supplementary Table 2). The largest number of publications were by Dodick, D.W. and Pezzini, A. (10 papers), followed by Ashina, M., Lipton, R.B. and Marrie, R.A. (9 papers), Goadsby, P.J., and Pietrzak, R.H. (8 papers), and Fuh, J.L., Kao, C.H., and Kurth, T. (7 papers) (Figure 4).

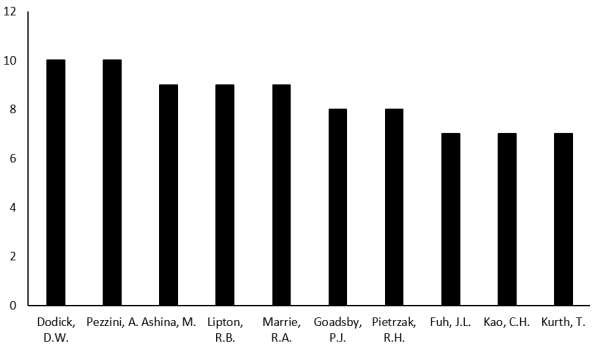

Figure 4. Top 10 authors published articles on hypertension and migraine.

Affiliations

The overall number of affiliations that have published articles on hypertension and migraine is 160 (Supplementary Table 3). Harvard Medical School had the most published articles (41 papers), followed by Charité – Universitätsmedizin Berlin (38 papers), Mayo Clinic (34 papers), Brigham and Women's Hospital (28 papers), University of Toronto (27 papers), Cleveland Clinic Foundation (25 papers), Københavns Universitet (25 papers), Inserm and University of California, Los Angeles (24 papers), and Massachusetts General Hospital (23 papers) (Figure 5).

Journals

The total number of journals that shared publications on hypertension and migraine is 160 (Supplementary Table 4). The most publications were found in 5 journals: Headache (59 papers), BMJ Case Reports (49 papers), Journal Of Headache And Pain (38 papers), Cephalalgia (35 papers), and Neurology (32 papers) (Figure 6).

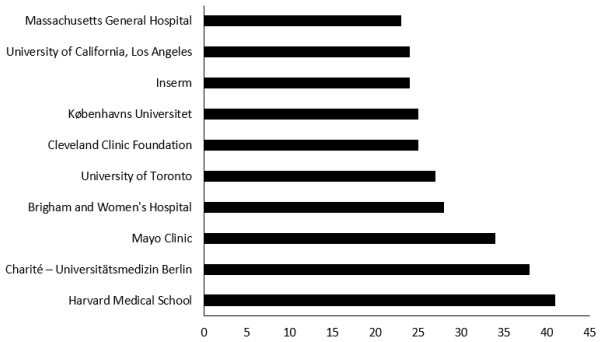

Figure 5. Top 10 affiliations that published articles on hypertension and migraine.

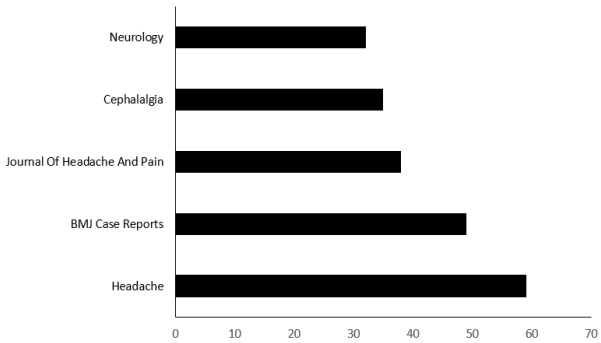

Figure 6. Top 5 journals shared publications on hypertension and migraine.

Supplementary Table 5 shows details about the top 5 journals published on hypertension and migraine, the total publications for each, the total number of citations, the cite score, the title of the most cited article, the times it was cited, and the publisher. The top 5 publishers were Wiley-Blackwell, BMJ Publishing Group, Springer Nature, SAGE, and Wolters Kluwer Health. The Neurology journal had the highest citation score (11.6), while BMJ Case Reports had the highest total citations (9745) and the highest total publications (7258). The most cited articles, cited 6108 times was by the Cephalalgia journal.

Most used key words

Figure 7 shows the most-used keywords. Migraine keyword appeared 1142 times, headache (608), hypertension (1399), complication (319), and risk factor (385).

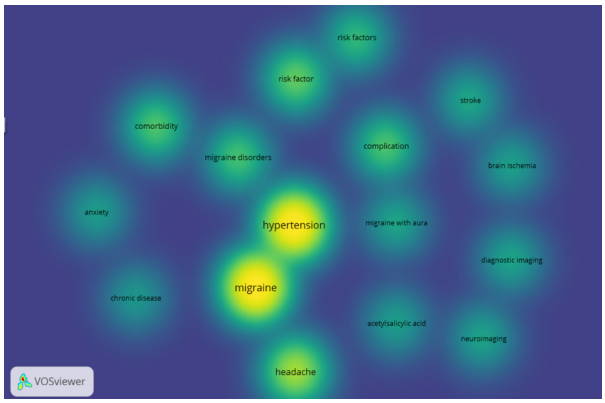

Figure 7. Most-used keywords.

Discussions

The initial search screened 6123 articles. When the search was restricted to the previous 10 years, from 2013 to 2022, it included 2859 articles. This search included only the medicine area in 2530 articles and was restricted to an article type in 1770 papers. English-language articles were 1724. The final publications number limited to hypertension and migraine keywords is 1611 (Supplementary Figure 1)

In this research, There have been 159 authors from 113 countries who have published on this topic, and in this time range, the most prolific regions are the United States, the United Kingdom and Italy. An increasing growth in the number of published articles was watched especially in the last few years.

The current study analyzed a total of 160 journals. Headache journal published the most articles on this subject, followed by BMJ Case Reports, Journal Of Headache And Pain, Cephalalgia, and Neurology. The largest number of published articles were by Dodick, D.W. and Pezzini, A. The most related keywords are Migraine keyword appeared 1142 times, headache (608), hypertension (1399), complication (319), and risk factor (385).

Migraine is now considered a warning sign for hypertension. The most cited article (6) in the top 10 countries published in this relation is considered a guide for all headache disorders and their comorbidities

including hypertension. Another article (7) focused on the controversial relationship between hypertension and migraine and returned to the theory that considered there is a relationship. A cross sectional study was applied to demonstrate the comorbidities of headache in older patients, and one of the comorbidities was hypertension(8). Another study revealed that migraine had a link with cardiovascular events in the presence of hypertension among type 2 diabetic patients (9). A cohort study was done and revealed that persistent migraine may be considered a predictor for the presence of hypertension (10).

Conclusion

This bibliometric analysis gives a general outlook for the results of hypertension and migraine all over the world. There has been a trendy growth in the number of publications screening the relationship between hypertension and migraine from 2013 to 2022. The highest number of publications were in the United States, the most productive authors being Dodick, D.W. and Pezzini, A., Harvard Medical School had the most published articles, and Headache journal was among the top 10 journals that had publications on this subject.

Conflict of interest Nil

Authors contribution only one author created the review

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