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Meningitis: A Bibliometric Analysis of 50 Top-Cited Articles

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Abstract

To identify the 50 top-cited articles on meningitis. The word "meningitis*" was searched in the title using the Elsevier's Scopus (ES) without any restriction on publication year, language, or study design. The articles were listed in a descending manner and data was extracted. Of the 33949 articles, the 50 top-cited articles with the word "meningitis" in their title were included in the study. The citation counts of the 50 top-cited articles on meningitis ranged from 309 to 1401. The first article was a communication, published in AIDS from Centers for Disease Control and Prevention, USA. The most productive year was 1997, with 05 out of the 50 top-cited articles. The journal with the maximum number of articles published (n=18) was the *New England Journal of Medicine* and the majority of the articles (n=27) were originated from the *United States of America*. Most of the articles were research articles (n=31). Yale University contributed to meningitis research with a maximum number of articles (n=6). The study helps the scientific and clinical community by providing valuable information on meningitis. This helps to recognize the recent trends, progression, new regimens, and outcomes in the field of meningitis.

Keywords: Meningitis, Viral meningitis, Bacterial meningitis, Bibliometric analysis

Introduction:

The word "meningitis" as a disease was responsible for 8.7 million reported cases globally, with 379,000 deaths around the world, even after the discovery and breakthroughs in signs and symptoms, treatment, and vaccination in 2015 (1-3). The inflammation of the meninges, which covers the brain is known as meningitis. An elevated level of leucocytes was observed in the cerebrospinal fluid (CSF). Meningitis is divided into two categories, bacterial and viral meningitis. These are confirmed by the presence of the disease-causing organism in the CSF. The presence of certain bacteria in the blood with signs & symptoms of meningism can also be an indication of bacterial meningitis (4). However, the mortality rate is 25-30 % even with the advancement in medicine and health setup. The condition was globally fatal before the discovery of drugs acting on bacteria (5, 6).

The term "meningitis" was defined by surgeon John Abercrombie in 1828 (6). By using this word, the first time in the field of meningitis, a bibliometric analysis was performed. There are several bibliometric analysis published in different topics and research fields including diet and breast cancer research (7), tumor immunotherapy (8), tuberculosis (9, 10), cardiovascular disease (11) etc.. Bibliometric analysis provides and helps the scientific community to recognize the top-cited articles with substantial impact on the clinical and research community, in a defined field of interest. It helps the community to update their understanding, knowledge, trends in research, past experiences, and future research in a specific fields. The study aimed to identify 50 top-cited articles on meningitis and provide the scientific and clinical community analysis of these articles. It will help the researcher community in their future research and clinical community to update their knowledge about the disease to perform their tasks efficiently.

Methods:

Ethical approval

The data was collected using the Elsevier's Scopus (ES) (www.scopus.com). No animals and patients were involved in this study. Therefore, no institutional ethical approval was required.

Study design and data search

An electronic search was carried out on December 28, 2020, utilizing the ES. The term "meningitis*" was searched in the article titles without any restriction of language, journal, year, and publication type. The articles were listed in descending order (highest citation) and reviewed manually.

Inclusion criteria

The 50 top-cited articles were downloaded and reviewed by the authors. All articles should have "meningitis" words in their title.

Data extraction

A total of 33949 articles were listed by the ES. The articles were listed according to the citation count in a descending manner. All articles were downloaded. The following data were extracted from each article: a) author list b) institutions, c) country, d) year of publication, e) journal name, f) keywords, and g) study design.

Keywords were extracted using the Visualization of Similarities (VOS) Viewer Software (www.vosviewer.com). This software has been widely using in bibliometric analysis to create a map of keywords according to their reoccurrence in the article (12).

The countries and institutions of the corresponding authors of the articles were used in the analysis of the contribution of institutions and countries. For the articles having two corresponding authors and from two different countries, we included both countries and institutions in the analysis.

Result:

Citation Count, Citation Density, and Current Citation Index

The 50 top-cited articles on meningitis are listed in Supplementary Table 1. The citation count of the 50-top cited articles ranged from 309 to 1401. The total citation count of all articles listed in the table is 25411. The first top-cited article on the list was published in Journal "AIDS" entitled "Estimation of the current global burden of cryptococcal meningitis among persons living with HIV/AIDS" in 2009 and published from "Centers for Disease Control and Prevention, USA" with a citation count of 1401 (13) (Figure 1). Its citation density (average citation count received per year from the date of publication) was 127.36, with Current citation index (CCI, number of citations received in 2020) 69. The

second article from the list was published in th journal "Clinical Infectious Diseases" entitled "Practice guidelines for the management of bacterial meningitis" in 2004 (14) with citation count, citation density, and CCI were 1339, 83.69, and 75, respectively. The third article from the list was published in "New England Journal of Medicine" entitled "Acute Bacterial Meningitis in Adults – A Review of 493 Episodes" in 1993 (15) with citation count, citation density, and CCI were 1071, 39.67, and 16, respectively.

According to CCI 2020, the top-most article was published in 2020 in the journal "International Journal of Infectious Diseases" entitled "A first case of meningitis/encephalitis associated with SARS-Coronavirus-2" (16) with CCI of 487 , followed by the article published in journal "The Lancet Infectious Diseases" in 2017 entitled "Global burden of disease of HIV-associated cryptococcal meningitis: an updated analysis" (17), with 226 CCI. The third ranked article was published in the journal "Clinical Infectious Diseases" entitled "Practice guidelines for the management of bacterial meningitis" (14) in 2004, with 75 CCI.

According to citation density (Figure 2), the case report published in 2020 had the highest score (16), followed by a research article published in 2017 (17), and a communication published in 2009 (13).

Year Wise Distribution

The 50 top-cited articles were published between 1974 (18) to 2020 (16) . 1997 with a total number of 5 articles (n=5) on the list was considered a productive year for meningitis in terms of publication number. The years 1992 and 2004 have the 2nd and 3rd highest number of publications (n=4, each) (Figure 3). The year with the highest citation was 1997 (n=2653 citation count), followed by 2004 and 1993 with a citation count of 1978 and 1972, respectively. The decade with the highest number of publications was 1990 (n=19 articles) (Figure 4) and with the highest citation was 2000 (n=9891 citation count).

Contributions of authors

Majority of articles (n=28) had between two and six authors. Few articles having different research groups/teams from different regions of the world were involved. These includes the members of The Active Surveillance Team (n=1 article), The Emerging Infectious Program Network (n=1), The European Dexamethasone in Adulthood Bacterial Meningitis Study Participants (n=1), and The National Institute of Allergy and Infectious Diseases Mycoses Study Group (n=3). The majority of the contributions were made by Diederik van de Beek (n=4 articles, 2794 citation), followed by Allan R. Tunkel (n=3,2745), W. Michael Scheld (n=4, 2416), William E. Dismukes (n=5, 2410), Jan de Gans (3, 2364), Arthur Reingold (n=3, 1883), Monica M. Farley (n=3, 1883), and other on Figure 5.

Contribution of countries and institutions

The 50 top-cited articles originated from 13 different countries of the world including, Australia, Finland, Germany, Japan, Netherlands, Norway, Panama, South Africa, Spain, Switzerland, the United Kingdom (UK), the United States of America (USA), and Vietnam.

According to number of publications, USA had maximum number of publications (n=27 articles, 14747 citations), followed by Netherlands (n=5, 3140), UK (n=5, 1959), Switzerland (n=2, 1020), Finland (n=2, 910), Vietnam (n=1, 654), Germany (n=2, 638), Japan (n=1, 496), Norway (n=1, 422), South Africa (1, 390), Spain (n=1, 356), Australia (n=1, 350), and Panama (n=1, 329) (Table 1).

The 50 top-cited articles were originated from 32 institutions, with reference to the affiliation of the corresponding author. Out of 50 articles, 6 articles were published by Yale University, USA (n=6 articles), ranked first in terms of number of publications, followed by Centre of Disease Control and Prevention, USA (n=4), University of Amsterdam, Netherlands (n=4), and others in Table 2.

Journal of Publication

The journal "New England Journal of Medicine" had the maximum number of articles on the list of 50-top cited articles (Table 3). Out of 50, 18 articles were published in this journal and ranked first, followed by Lancet (n=7 articles), Annals of Internal Medicine, and The Lancet Infectious Diseases (n=3 each). New England Journal of Medicine had the highest citation (n=10334 citation), followed by Lancet (n=3263), and Clinical Infectious Disease (n=1659).

The impact factor of journals ranged from 74.699 (New England Journal of Medicine) to 2.126 (Pediatric Infectious Disease Journal). Review of Infectious Disease Journal were renamed to Clinical Infectious Disease in 1992.

Study design

According to the study design (Table 4), most articles were research articles (n= 31 articles, 15696 citations), followed by review articles (n=5, 2095), randomized controlled trials (n=4, 1434), meta-analysis (n=3, 1251), seminar (n=2, 985), communication (n=1, 1401), guidelines (n=1, 1339), case reports (n=1, 496), and personal view (n=1, 390), and a systematic review and meta-analysis (n=1, 324).

Keywords

93 Keywords were identified using VOS software (Figure 6). The most occurring keywords were human (n=46 occurrences), followed by articles (n=32), adult (n=28), major clinical studies, and others on the figure 6.

Discussion:

Citation analysis in any respective field, it can always generate immense data on authors, institutions, and journals. It helps in the identification of papers with significant contributions and journals with high impact factors (19). It was identified in different research articles that a higher citation count of an article is a clear indication of the quality of research conducted as identified by the research scholars (20). The study aimed to identify, rank, and characterize the 50 top-cited articles on meningitis. The bibliometric analysis study was conducted to identify the most cited articles (classic articles) and point out recent trends in the respective field. These types of studies can help the scientific community to easily identify quality publications (21) and help the doctors to perform the daily tasks (22). This article provides and generates quantitative data about authors, countries, institutions, journals, and keywords that helps the clinicians and research community to understand and design future research (23).

In the current study, Scopus was used to identify 50 top-cited articles on meningitis. Scopus was considered as the benchmark for research by the scientific community. It is also considered as the largest database. It is always used by the scientific community for analysis and it has been used in different published bibliometric analysis articles (24-26). It is specially designed to retrieve citations from the publications of only peer-reviewed journals, however, other databases like Google Scholar retrieve citations from open-access online journals, books, dissertations, theses, and many nonscholarly sources (26). Therefore, an article must have a higher citation count in Google Scholar, when compared to Scopus.

What is a classic article? There were two different opinions presents in the scientific community. First, if an article has more than 400 citation, it is included in classic articles (27). Second, it was depending upon the specific field. A field with few researchers, an article having 100 or 100 plus citation, can be included in classic articles (28). In this study, the citation count ranged from 1401 – 309 citations. The article ranked first on the 50 top-cited articles has 1401 citations means meningitis field had few researchers. There was a lack of contribution from all over the world in this field. Therefore, we considered an article having 100 or 100 plus citations as the classic in this study. The article with the least number of citations (n=309) was also considered as the classic article in meningitis.

The current study and the previous studies (29-32) also revealed that the main contributing country is always USA. It is due to the presence of large financial resources (in terms of job opportunities for scientists, attracting scientific minds, and other benefits for the community), and the presence of a large scientific community in different fields (33, 34). The young scientists from all over the world also wanted to collaborate and start their academic career in USA. The Netherlands ranked second as a contributing country in the field of meningitis, followed by UK, Finland, Germany, and others. It was also identified that there was negligible contribution from Asia, Middle East, and South America. There must be a need of international collaboration in these countries because meningitis can affect people from all over the world. World Health Organization and the United Nation Organization should come forward and address this issue as early as possible. This can help the medical and scientific community to understand more about the disease, its spread, new regimens, and overall health benefits for the community.

The 50 top-cited articles were published in 21 different journals, which is a clear indication of the multidisciplinary nature of research in the field of meningitis. Most of the articles were published in New England Journal of Medicine with the highest

impact factor among the journals publishing 50 top-cited articles on meningitis. The main contributions of the publications in this study were of original research articles, followed by review articles, randomized controlled trials, meta-analysis, seminars, communications, guidelines, case reports, personal views, and systematic review and meta-analysis.

In bibliometric analysis, the year of publication can easily influence the study. In previous studies, it was identified that the date of publication can affect the total citation count of each article (35, 36). Surprisingly, an article published in 2020 was able to be ranked 18th in the list within a few months. The article was the first case report of meningitis associated with Novel coronavirus (SARS-Coronavirus-2: SARS-CoV-2). This might be the reason that after the breakout of COVID-19, it was the focus of the research community worldwide. In the current study, the year of publication ranged from 1974 – 2020 with the highest number of publications and citation count in the year 1997.

The main contributing factor in any bibliometric analysis is the year of publication. It is a definitive indicator of the citation count that an article received (36). The time of recent articles were indeed not comparable with the older articles. The order articles can gain easily more citation than new articles because of the time frame, regardless of their quality and impact (37). It was also accepted by the scientific community that articles published in the last 15 years usually have a very hard time to appear in the top cited articles in some research fields (38). However, we have observed a mixed trend in our analysis. 12 out of 50 articles were published in the last 15 years and considered as the most cited articles in the field of meningitis. From 1990 – 2005, 29 articles were able to make their place on the list of most cited articles and before 1990 only 9 articles were able to be considered as the most cited articles.

Generally, there were some limitations of bibliometric analysis studies. In this study, we have observed a few limitations. First, we have only included the articles with the word "meningitis" in their title. It might be possible that there were few articles with the focus on meningitis, but the title lacks this word. Secondly, we have only used a single database and not included the results of other databases such as Google Scholar and Web of Science.

Best to the researcher's knowledge, this is the first bibliometric analysis on the 50 top cited articles on meningitis. There are some weakness and limitations of our study, but we were able to generate fruitful data for the scientific and clinical communities in the field of meningitis. This allows the recognition of recent trends, progression, advances, and new regimens in the field of meningitis. It helps the community to recognize the contributing countries, institutions, authors, and journals in the field of meningitis. It provides the analysis of previous research trends and directions for future research. There is an immense need of international collaboration because meningitis can affect people from all over the world. This will increase our understanding about the disease, disease causing pathogens, new regimens, patient symptoms, and therapeutic outcomes.

Table 1: List of contributing countries with the number of publications and total citation count

Name of Country	No. of Publication	Total Citation Count
USA	27	14747
Netherlands	5	3140
UK	5	1959
Switzerland	2	1020
Finland	2	910
Vietnam	1	654
Germany	2	638
Japan	1	496
Norway	1	422
South Africa	1	390
Spain	1	356
Australia	1	350
Panama	1	329

Table 2: List of contributing institutions with the number of publications

Name of Institution	No. of Publication	Total Citation Count
Yale University, USA	6	2271
Centers for Disease Control and Prevention,USA,	4	3302
University of Amsterdam,the Netherlands	4	2794
National Institutes of Health, USA	3	1355
London School of Hygiene and Tropical Medicine, UK	2	811
University of Alabama at Birmingham, USA	2	852
University of Helsinki, Finland	2	910
University of Texas Southwestern Medical Center, USA	2	844
World Health Organization, Switzerland	2	1020

Table 3: List of journals that published the 50 top-cited articles on meningitis

Journals	Impact Factor*	5 Years Impact Factor*	Journal Age	Number of Articles	Total Citation
New England Journal of Medicine	74.699	72.098	208	18	10334
Lancet	60.39	59.345	197	7	3263
JAMA: The Journal of the American Medical Association	45.54	47.677	137	2	668
Journal of Clinical Oncology	32.956	25.597	37	1	335
The Lancet Infectious Diseases	24.446	22.945	19	3	1308
Clinical Microbiology Reviews	22.556	27.071	32	1	430
Annals of Internal Medicine	21.317	19.792	93	3	1109
Journal of Clinical Investigation	11.864	13.393	96	1	327
Journal of Experimental Medicine	11.743	11.984	124	1	422
Brain	11.337	11.931	142	1	323
Clinical Cancer Research	10.107	10.115	25	1	398
Neurology	8.77	8.899	69	1	505
Clinical Infectious Diseases	8.313	8.845	41	2	1659
International Journal of Epidemiology	7.707	9.305	48	1	487
Journal of Clinical Microbiology	5.897	4.663	45	1	482
Journal of Infectious Diseases	5.022	5.057	116	1	389
AIDS	4.534	4.618	32	1	1401
International Journal of Infectious Diseases	3.202	3.315	24	1	496
International Journal of Medical Microbiology	3.113	3.413	20	1	315
Pediatric Infectious Disease Journal	2.126	2.324	188	1	414
*Reviews of Infectious Diseases***	name is discontinued		41	1	346

*Journal citation report 2019, **Renamed as Clinical Infectious disease (impact factor= 8.313)

Table 4: Study design of 50 top-cited articles with meningitis with the number of publications and total citation count

Study Design	No. of Publications	Total Citation Count
Research articles	31	15696
Review	5	2095
Randamoized Clinical Trial	4	1434
Meta-analysis	3	1251
Guidelines	2	1339
Seminar	2	985
Communication	1	1401
Case report	1	496
Personal View	1	390
A systematic review and meta-analysis	1	324

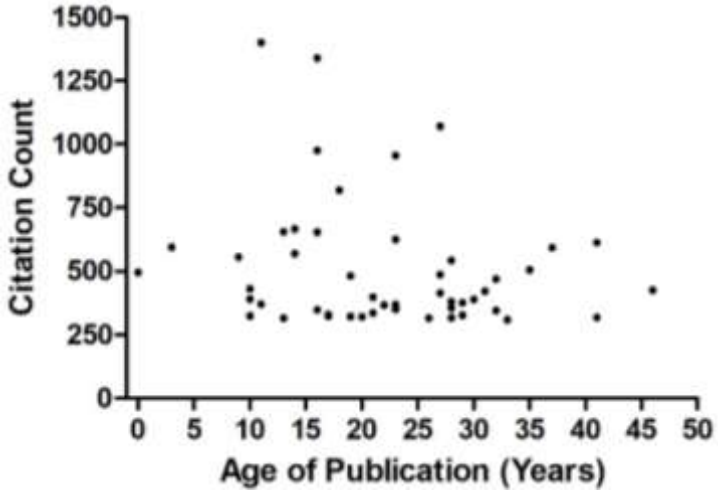

Figure 1: Association of citation count with age of publication

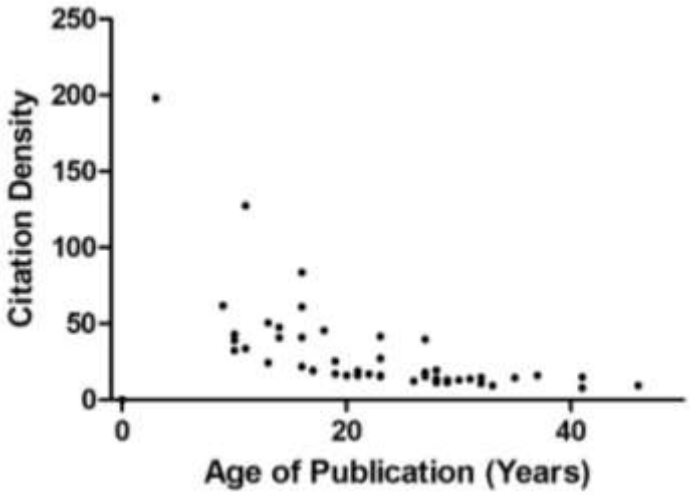

Figure 2: Association of citation density with the age of publication

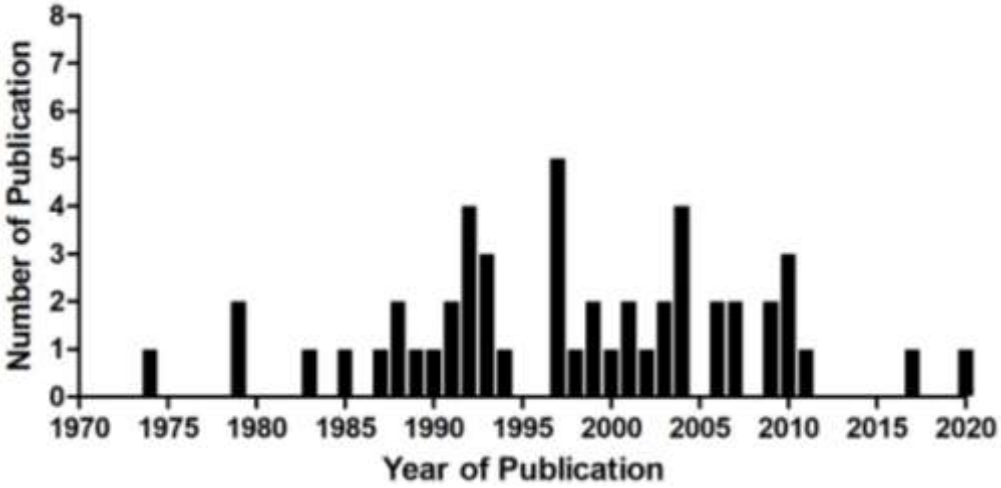

Figure 3: Citation analysis of 50 top-cited articles on meningitis over the years

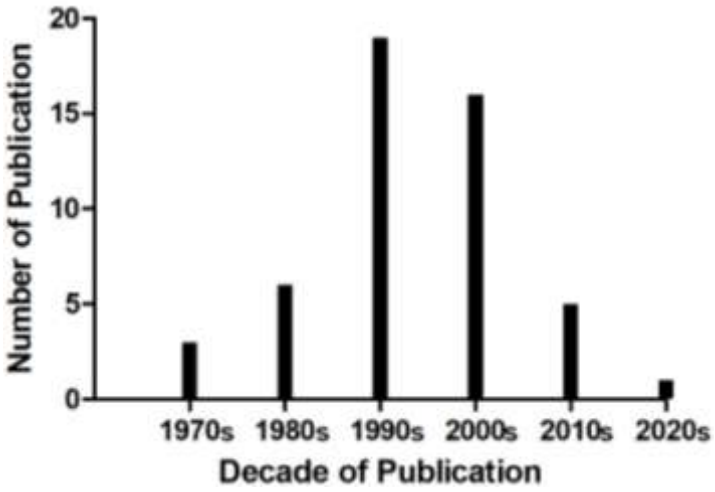

Figure 4: Citation analysis of 100 top-cited articles on meningitis over the decades

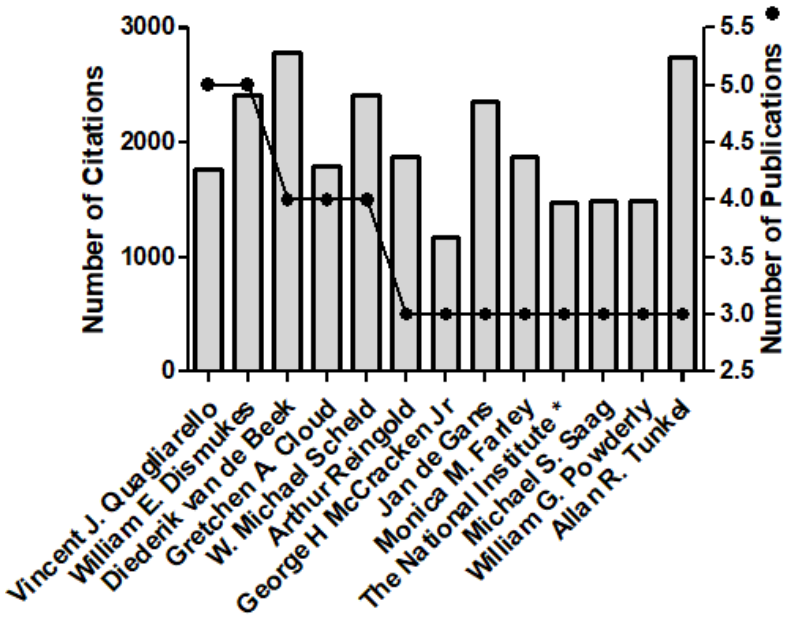

Figure 5: Citation analysis of the authors who contributed to the 50 top-cited articles (Line graph shows the number of publications and bar graph represents the number of citations per author, only authors with a minimum of three articles in the 50 top-cited articles were shown)

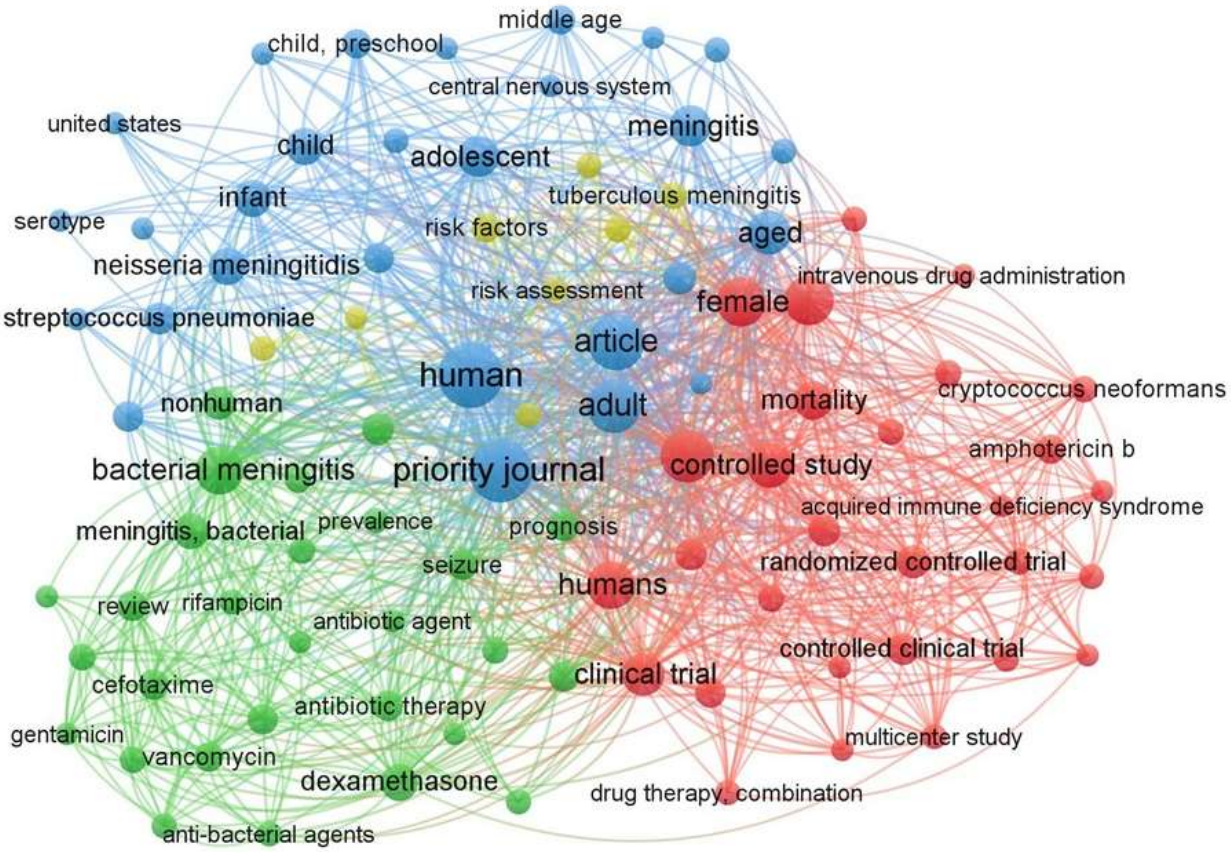

Figure 6: The distribution of keywords of the 50-top cited articles on meningitis. The size of the node (color) represents the frequency of the keyword used.

Supplementary table:

Supplementary Table 1: 50 Top-cited articles on meningitis

Rank	Publication title	First Author	Journal Name	Year of Publication	Citation
1	Estimation of the current global burden of cryptococcal meningitis among persons living with HIV/AIDS (13)	Benjamin J. Parka	AIDS	2009	1401
2	Practice guidelines for the management of bacterial meningitis (14)	Allan R. Tunkel	Clinical Infectious Diseases	2004	1339
3	Acute Bacterial Meningitis in Adults – A Review of 493 Episodes(15)	Marlene L. Durand	New England Journal of Medicine	1993	1071
4	Clinical features and prognostic factors in adults with bacterial meningitis(39)	Diederik van de Beek	New England Journal of Medicine	2004	976
5	Bacterial meningitis in the United States in 1995(40)	Anne Schuchat	New England Journal of Medicine	1997	956
6	Dexamethasone in adults with bacterial meningitis(41)	Jan De Gans	New England Journal of Medicine	2002	819
7	Effect of BCG vaccination on childhood tuberculous meningitis and miliary tuberculosis worldwide: a meta-analysis and assessment of cost-effectiveness(42)	B Bourdin Trunz	Lancet	2006	667
8	Epidemic meningitis, meningococcaemia, and Neisseria meningitidis(43)	David S Stephens	Lancet	2007	656
9	Dexamethasone for the treatment of tuberculous meningitis in adolescents and adults(44)	Guy E. Thwaites	New England Journal of Medicine	2004	654
10	Treatment of cryptococcal meningitis associated with the acquired immunodeficiency syndrome(45)	CHARLES M. VAN DER HORST	New England Journal of Medicine	1997	625
11	A Comparison of Amphotericin B Alone and Combined with Flucytosine in the Treatment of Cryptoccal Meningitis(46)	J E Bennett	New England Journal of Medicine	1979	613
12	Global burden of disease of HIV-associated cryptococcal meningitis: an updated analysis (17)	Radha Rajasingham	The Lancet Infectious Diseases	2017	594

13	ANTIGENIC SIMILARITIES BETWEEN BRAIN COMPONENTS AND BACTERIA CAUSING MENINGITIS. Implications for Vaccine Development and Pathogenesis(47)	Jukka Finne	The Lancet	1983	593
14	Community-acquired bacterial meningitis in adults(48)	Diederik van de Beek	New England Journal of Medicine	2006	569
15	Bacterial meningitis in the United States, 1998-2007(49)	Michael C. Thigpen	New England Journal of Medicine	2011	556
16	Comparison of amphotericin b with fluconazole in the treatment of acute aids-associated cryptococcal meningitis(50)	Michael S. Saag	New England Journal of Medicine	1992	543
17	The triad of neurologic manifestations of lyme disease: Meningitis, cranial neuritis, and radiculoneuritis(51)	Andrew R. Pachner,	Neurology	1985	505
18	A first case of meningitis/encephalitis associated with SARS-Coronavirus-2 (16)	Takeshi Moriguchia	International Journal of Infectious Diseases	2020	496
19	Protective effect of bcg against tuberculous meningitis and miliary tuberculosis: A meta-analysis(52)	Laura C Rodrigues	International Journal of Epidemiology	1993	487
20	Simultaneous detection of Neisseria meningitidis, Haemophilus influenzae, and Streptococcus pneumoniae in suspected cases of meningitis and septicemia using real-time PCR(53)	C. E. Corless	Journal of Clinical Microbiology	2001	482
21	Dexamethasone Therapy for Bacterial Meningitis(54)	Marc H. Lebel	New England Journal of Medicine	1988	469
22	Epidemiology, diagnosis, and antimicrobial treatment of acute bacterial meningitis(55)	Matthijs C. Brouwer	Clinical Microbiology Reviews	2010	430
23	Prognostic factors in cryptococcal meningitis. A study in 111 cases (18)	RICHARD D. DIAMOND	Annals of Internal Medicine	1974	426
24	Local production of tumor necrosis factor α, interleukin 1, and interleukin 6 in meningococcal meningitis: Relation to the inflammatory response(56)	A Waage	Journal of Experimental Medicine	1989	422
25	Outcomes of bacterial meningitis in children: A meta-analysis(57)	L J Baraff	Pediatric Infectious Disease Journal	1993	414

26	A randomized controlled trial comparing intrathecal sustained-release cytarabine (DepoCyt) to intrathecal methotrexate in patients with neoplastic meningitis from solid tumors(58)	Michael J. Glantz	Clinical Cancer Research	1999	398
27	Tuberculous meningitis: a uniform case definition for use in clinical research(59)	Suzaan Marais	The Lancet Infectious Diseases	2010	390
28	Bacterial meningitis in the United States, 1986: Report of a multistate surveillance study(60)	Jay D. Wenger	Journal of Infectious Diseases	1990	389
29	Bacterial Meningitis: Pathogenesis, Pathophysiology, and Progress(61)	V Quagliarello	New England Journal of Medicine	1992	381
30	The Beneficial Effects Of early Dexamethasone Administration in Infants and Children with Bacterial Meningitis(62)	Carla M. Odio	New England Journal of Medicine	1991	375
31	Effect of pneumococcal conjugate vaccine on pneumococcal meningitis(63)	Heather E. Hsu	New England Journal of Medicine	2009	371
32	Treatment of bacterial meningitis(64)	Vincent J. Quagliarello	New England Journal of Medicine	1997	369
33	Community-acquired bacterial meningitis: Risk stratification for adverse clinical outcome and effect of antibiotic timing(65)	Steven I. Aronin	Annals of Internal Medicine	1998	367
34	Tuberculous meningitis in patients infected with the human immunodeficiency virus(66)	Juan Berenguer	New England Journal of Medicine	1992	356
35	Randomised trial of Haemophilus influenzae type-b tetanus protein conjugate for prevention of pneumonia and meningitis in Gambian infants(67)	Kim Mulholland	Lancet	1997	353
36	Dexamethasone as adjunctive therapy in bacterial meningitis: A meta- analysis of randomized clinical trials since 1988(68)	Peter B. Mclntyre	Journal of the American Medical Association	1997	350
37	Combination antifungal therapies for HIV-associated cryptococcal meningitis: A randomised trial (69)	Annemarie E Brouwer	Lancet	2004	348
38	Meningitis caused by streptococcus suis in humans(70)	J. P. Arends	Reviews of Infectious Diseases	1988	346

39	Randomized trial of a slow-release versus a standard formulation of cytarabine for the intrathecal treatment of lymphomatous meningitis(71)	Michael J. Glantz	Journal of Clinical Oncology	1999	335
40	Bacterial meningitis in children(72)	Xavier Sáez-Llorens	The Lancet	2003	329
41	Recombinant human interleukin-1 induces meningitis and blood-brain barrier injury in the rat: Characterization and comparison with tumor necrosis factor(73)	V J Quagliarello	Journal of Clinical Investigation	1991	327
42	Global and regional risk of disabling sequelae from bacterial meningitis: A systematic review and meta-analysis(74)	Karen Edmond	The Lancet Infectious Diseases	2010	324
43	Pneumococcal meningitis in adults: Spectrum of complications and prognostic factors in a series of 87 cases(75)	Stefan Kastenbauer	Brain	2003	323
44	Computed tomography of the head before lumbar puncture in adults with suspected meningitis(76)	Rodrigo Hasbun	New England Journal of Medicine	2001	322
45	Diagnosis and management of increased intracranial pressure in patients with AIDS and cryptococcal meningitis(77)	J R Graybill	Clinical Infectious Diseases	2000	320
46	Tuberculous Meningitis (78)	Dermot H. Kennedy	JAMA: The Journal of the American Medical Association	1979	318
47	Rapid disappearance of Haemophilus influenzae type b meningitis after routine childhood immunisation with conjugate vaccines(79)	H Peltola	The Lancet	1992	317
48	Aseptic meningitis associated with high-dose intravenous immunoglobulin therapy: Frequency and risk factors (80)	Elizabeth A. Sekul	Annals of Internal Medicine	1994	316
49	Avian pathogenic, uropathogenic, and newborn meningitis-causing Escherichia coli: How closely related are they?(81)	Christa Ewersa	International Journal of Medical Microbiology	2007	315

50	Treatment of Cryptococcal Meningitis with Combination Amphotericin B and Flucytosine for Four as Compared with Six Weeks(82)	William E. Dismukes	New England Journal of Medicine	1987	309

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