

Bibliometric analysis of scientific research on Crimean-Congo hemorrhagic fever in Turkey

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ABSTRACT

Objectives: Since the first case of Crimean-Congo hemorrhagic fever (CCHF) was detected in our country in 2002, the number of cases has been steadily increasing. The purpose of this study is to evaluate and provide a bibliographic review of national literature studies on this endemic and life-threatening disease in our country and conduct content analysis to guide future studies.

Materials and methods: In this study, an investigation was conducted using the website TR Dizin, one of our national databases. Between 1960 and 2019, the keywords 'Crimean-Congo hemorrhagic fever' and 'KKKA' were used to search for publications in scientific databases in the medical subject category. Only 41 research articles were included in the study out of a total of 101 that were accessed. Bibliographic analysis was carried on the studies.

Results: A total of 41 publications were analyzed in this study. The most scientific articles (43.9%) were detected between 2011 and 2015. Ankara, Erzurum, Istanbul, and Sivas were the most commonly studied provinces; one study was conducted in two provinces (Kırşehir and Ankara) and two studies were conducted abroad (Cyprus and Iran). The majority of the papers were retrospective studies with patient samples, written in Turkish. The number of cases in the sample ranged from 8 to 1,250 cases. Five of the studies (12.2%) were conducted in the pediatric age group. The rate of publications in the Web of Science (WOS) indexed journals was 46.3%. While 21 (51.2%) of the publications were cited, 13 of them were found in the WOS index. According to content analysis of the publications, demographic characteristics, epidemiological examination (36.6%) and clinical features (31.7%) were the most investigated.

Conclusion: It is critical to expand the number of CCHF studies published in our country and to establish research methodologies, particularly molecular investigation, for epidemic treatment and control.

Keywords: Bibliographic analysis, Crimean-Congo hemorrhagic fever, National literature.

Crimean-Congo hemorrhagic fever (CCHF) is caused by a tick-borne viral (Nairovirus) infection of the Bunyaviridae family. Crimean hemorrhagic fever was the name given to the disease when it was first identified in Crimea in 1944. It was eventually recognized as the cause of disease in Congo in 1969, and the disease was given its current name.^[1] Among the Arboviruses, which include all tick-borne viruses that cause disease in humans, the Crimean-Congo hemorrhagic fever virus has the second most widespread geographic distribution after the Dengue virus.^[2]

Crimean-Congo hemorrhagic fever is prevalent throughout Eastern Europe, mainly in the former Soviet Union, throughout the Mediterranean, Northwestern China, Central Asia, Southern Europe, Africa, the Middle East, and the Indian subcontinent.^[1]

Crimean-Congo hemorrhagic fever is one of the most severe viral diseases for humans.^[3] Humans can contract the virus by being bitten by infected ticks or interacting with infected animals' blood, tissue, or body fluids. Nosocomial and sexual transmission is also possible.^[1] Prior to the

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onset of the hemorrhagic syndrome, the condition is usually characterized by nonspecific signs and symptoms. In general, a 5 to 30% mortality rate is reported.^[3]

Crimean-Congo hemorrhagic fever has been on the list of mandatory diseases for our country since 2003, and around 10,000 cases have been reported to the Ministry of Health throughout the 15-year period between 2002 and 2017 (Figure 1). Furthermore, a 4-5 % fatality rate and a 0.88-0.20% mortality rate are reported, both of which are decreasing over time.^[4,5] The majority of cases (95%) emerge from the Northern region of the Central Anatolia and Eastern Anatolia regions, especially in the provinces of Tokat, Sivas, Çorum, and Erzurum.^[6]

The prevention, management, and treatment of this life-threatening disease, which is endemic to our country, require research. The main objective of this study is to examine and conduct a bibliographic review of national literature studies on this endemic and life-threatening disease in our country by making content analysis to help guide future research.

MATERIALS AND METHODS

The website “<https://app.trdizin.gov.tr/>” of our national database, TR Dizin, was used to conduct this research. The keywords 'Crimean-Congo Hemorrhagic Fever' and 'KKKA' were used to search databases in the medical subject category for papers published between December 1960 and 2019. Only research articles were

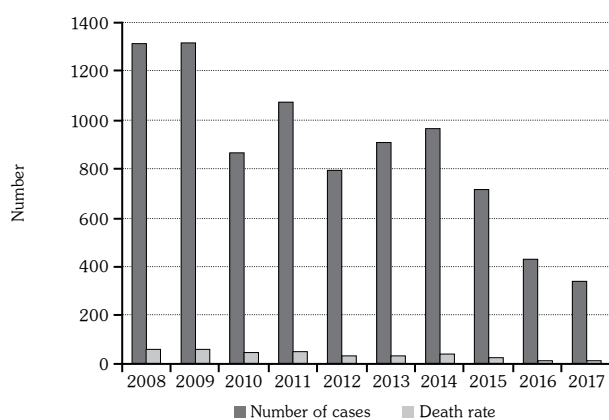


Figure 1. Distribution of patients diagnosed with Crimean-Congo hemorrhagic fever according to year.^[4]

included in the study, out of a total of 101 articles accessed. Other studies (reviews, case reports, letters to the editor, etc.) were excluded from the study. Moreover, articles with keywords in their titles, but irrelevant content was eliminated from the evaluation. Only 41 studies with contents consisting of “Crimean-Congo hemorrhagic fever” and “CCHF” were bibliographically examined.

RESULTS

A total of 41 publications were included in the evaluation. It was determined that one of the studies was published in 2008, four in 2009, four in 2010, five in 2011, and 14 between 2016-2019, with the highest number of studies (43.9%) published between 2011 and 2015 (Figure 2).

There were a total of 175 authors, and it was determined that publications with four and six authors were most frequent (21.9%). Mean (standard deviation) number of pages of the publications was 5.58 ± 2.11 , and mean number of references was 19.97 ± 7.75 . In terms of province, studies were most frequently conducted in the provinces of Ankara, Erzurum, Istanbul, and Sivas; it was determined that one study was conducted in two provinces (Kırşehir and Ankara) and two studies were conducted abroad (Cyprus and Iran). The majority of the studies were retrospective, in Turkish, and used patient samples. Sample size ranged from 8 to 1,250. Five (12.2%) of the studies were conducted in the pediatric age group. Only three (7.3%)

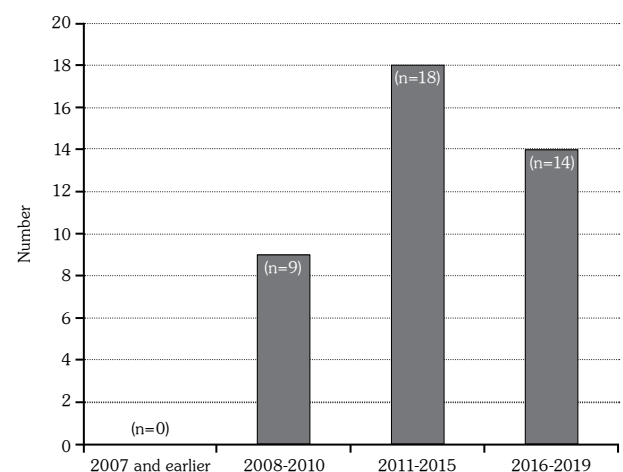


Figure 2. Distribution of articles over the years.

Table 1. General characteristics of the publications (n=41)

Characteristic	n	%
Province		
Ankara	6	14.6
Erzurum	5	12.2
Istanbul	5	12.2
Sivas	3	7.3
Artvin	2	4.8
Rize	2	4.8
Adiyaman	2	4.8
Elazığ	2	4.8
Other	14	34.1
Type of institution		
University Hospital	24	58.6
State Hospital	12	29.2
Other	5	12.2
Institution (most frequent)		
Atatürk University Medical Faculty	4	9.6
Cumhuriyet University Medical Faculty	3	7.3
Firat University Medical Faculty	3	7.3
Number of authors		
1	3	7.3
2	7	17.1
3	3	7.3
4	9	21.9
5	6	14.6
6	9	21.9
7	3	7.3
8	1	2.4
Publication language		
Turkish	26	63.4
English	15	36.6
Access to complete text		
Open	34	82.9
Closed	7	17.1
Study type		
Retrospective	15	36.6
Prospective	13	31.7
Questionnaire	8	19.5
Outbreak analysis	1	2.4
Observational	3	7.3
Crosssectional	1	2.4
Sample		
Patient	21	51.2
Healthcare workers	7	17.1
Tickborne	4	9.6
Volunteers	3	7.3
Students	1	2.4
Blood/serum samples	2	4.8
Exposure to indexed cases	1	2.4
Potential cases	1	2.4
Other	1	2.4
Published Journal		
KLIMIK	6	14.6
FLORA	4	9.6
Journal of Pediatric Infection	4	9.6
Turkish Journal of Medical Sciences	2	4.8
Journal of Microbiology and Infectious Diseases	2	4.8
Eurasian Journal of Medicine	1	2.4
Journal of Clinical and Analytical Medicine	2	4.8
Bulletin of Microbiology	1	2.4
Other	18	43.9
Type of published journal		
Scanned in WOS	19	46.3
ESCI	16	39
SCIE	3	7.3

Journals scanned in the Web of Science (WOS) index include: Journal of Pediatric Infection, Eurasian Journal of Medicine, KLIMIK and FLORA which are indexed in the Emerging Sources Citation Index (ESCI). Bulletin of Microbiology and the Turkish Journal of Medical Sciences are indexed in Science Citation Index Expanded (SCIE).

studies included a control group. The number of keywords in the studies varied from 2 to 6. Most of the studies had been published in the Klimik Journal. 46.3% of publications scanned in the Web of Science (WOS) index were found in journals. (Table 1).

In terms of keywords, studies with three keywords at most were the most frequent (Figure 3). While 21 (51.2%) of the publications were cited, the remaining 20 (48.8%) were not (Figure 4). 13 of the 21 cited publications were detected in a journal scanned in the WOS index. Demographic characteristics, epidemiologic assessment (36.6%), and clinical features (31.7%) were found to be the most frequently investigated in terms of content analysis.

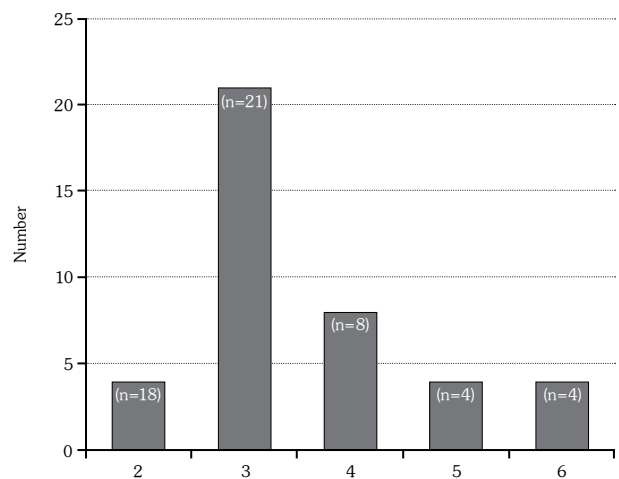


Figure 3. Evaluation of keywords of the publications.

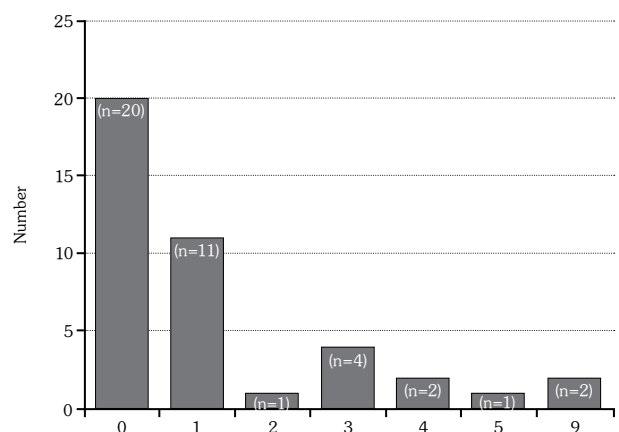


Figure 4. Number of citations of the publications.

DISCUSSION

After the CCHF was first detected in our country in a group of patients who presented with fever and petechial rash in the province of Tokat in 2002, the number of cases has continued to rise at a rapid pace.^[7] Karti et al.^[8] initially identified CCHF in the etiology of five patients using RT-PCR in Turkey in 2003, in collaboration with the Centers for Disease Control and Prevention (CDC). The number of CCHF cases reported in our country reached a peak in the following years, especially in 2008 and 2009, before gradually declining.^[7] According to our evaluation, one study was published in 2008, four in 2009, four in 2010, five in 2011, and 14 between 2016-2019, with the most studies (n=18) published between 2011 and 2015. These findings may indicate that the disease still remains to be a current issue in our country.

Turkey's geographic location serves as a natural bridge between Europe, Asia, and Africa, allowing numerous new or reoccurring diseases to spread. Numerous marshes or migratory bird stations such as the "Sultan Marshes" in the Kayseri province of Central Anatolia, "Manyas Bird Paradise" in the Marmara region, the "Kızılırmak Delta" near Bafra or "Gernek Lake" in Samsun in the Black Sea region, in "Hevsel Gardens" in Diyarbakir in the Southeast, and "Aras River Bird Paradise" in the Northeast are all of high epidemiological significance for the transmission of tick and tick-borne diseases.^[9] According to the data of the Turkish Ministry of Health, cases were most prevalent in the provinces of Tokat, Yozgat, Sivas, Erzurum, Çorum, Erzincan, and Artvin in 2002-2003, but cases began to emerge nationwide in 2017.^[10] However, the disease remains endemic, mainly in the Northeastern Anatolian region of Turkey (Tokat, Amasya, Sivas, Gümüşhane, Yozgat, and Çorum).^[11] According to a bibliometric analysis of CCHF by Dereli et al.,^[12] Cumhuriyet University conducted the most studies, 54 (3.6%) of the 1,480 research studies in Turkey, followed by Ankara Numune Training and Research Hospital with 49 (3.3%) studies, and Karadeniz Technical University and Bozok University in third and fourth place, respectively. In our study, the provinces of Ankara, Erzurum, Istanbul, and Sivas were found to be the most frequently

examined. In our review of 41 studies, we observed that most studies were conducted in universities, with the majority of studies coming from Atatürk University Medical Faculty, which is located in an endemic region.^[13-53] There were studies from our two metropolitan cities as well as the endemic regions of Sivas and Erzurum. This could be due to referrals from other provinces to those cities. Furthermore, since the provinces surrounding Ankara have a large number of cases and serve as a central focus for many diseases in the surrounding provinces, it could be a center for CCHF disease.

Another possibility is that certain studies were not published in journals scanned in TR Dizin, while another is that, while one study that examined CCHF cases in Samsun in 2019^[54] was listed in TR Dizin, it was not included in the study's website, suggesting that the necessary updates are still being made. In addition, because the keywords chosen were in Turkish, English-only studies were not included in the index.^[55]

While the majority of studies focused on patients, the second most prevalent subject was healthcare workers. According to Turkish Ministry of Health data from 2016, 0.7% of cases were healthcare professionals, with no nosocomial infections detected. These three cases came from the cities of Aydın, Elazığ, and Erzurum; two of them were caused by tick attachment, while one of them was from a rural area.^[4] Six studies were related to healthcare professionals among the studies examined in our evaluation, demonstrating that this problem is important to researchers as well as the Turkish Ministry of Health. In a bibliometric analysis of major infectious diseases, Sweileh et al.^[55] reported that Turkey ranked first in studies related to CCHF. In our study, the rate of studies published in journals scanned in WOS was 46.3%. While 21 (51.2%) of the publications were cited, 20 (48.8%) were not cited at all 13 of the 21 cited publications were found to have been published in a WOS-indexed journal. There were no studies analyzing the content of publications related to CCHF in the existing literature. According to our findings, most studies investigated demographic characteristics, followed by epidemiologic assessment (36.6%), and clinical features (31.7%).

Study limitations

The number of studies was insufficient, as only national database was evaluated.

Conclusion

It is essential to increase the number of CCHF studies published in our country and to improve research strategies, especially molecular examination, for epidemics prevention and diagnosis.

Declaration of conflicting interests

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