

History of Crimean–Congo Hemorrhagic Fever in Iraq: A Review

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ABSTRACT

Worldwide, Crimean-Congo hemorrhagic fever is the most common tick-borne viral disease. The causes are Nairoviruses. from animals to humans are transmission of the virus by tick bites or by connection with the tissues and blood of infected animals directly through or after butchery immediately, and from person to person through interaction with the blood, excretions, or fluids of the body of an ill person. Farmers and pastoralists are the most vulnerable because of their bigger experience of ticks; keepers of livestock due to their connection with primates that act as hosts without symptoms of the illness; and employees of healthcare, regarding their increased danger of hospital-acquired contagions. Ribavirin has been used to treat Crimean-Congo hemorrhagic fever after WHO approval. Awareness campaigns on risk factors and control measures have helped to reduce the spread of the disease to a greater level. Conclusions: In Iraq and before 1979, Crimean-Congo hemorrhagic fever was not documented. Later, several outbreaks happened, and the illness became endemic through recurring outbreaks. In 2023, the most significant outbreak in Iraq in recent times, as the lack of protective measures in addition to the management throughout the pandemic of Covid-19 have a major for the increase in illness, in addition to the occurrence of non-licensed butchers, particularly in Eid al-Adha, played an important role in this epidemic.

Keywords:

Crimean-Congo Hemorrhagic Fever, Prevention, The Diagnosis, The History, The Treatment

1 Introduction

CRIMEAN-Congo Hemorrhagic Fever (CCHF) is a tick-borne animal-origin illness initiated by a Nairovirus belonging to the Bunyaviridae [1], with a case rate of fatality up to 40% [2]. It was primarily acknowledged among Soviet soldiers in the Crimean Peninsula (1944) [1]. CCHF is endemic in Asia, Africa, southern Europe, and the Middle East [3]. The main clinical symptoms and signs are fever, headache,

fatigue, vomiting, and diarrhea. In severe cases, it may develop Hepatomegaly, confusion, lymphadenopathy, and hemorrhagic symptoms [1]. The extent of the incubation period is influenced by the virus's transmission mode. It is usually one to three days next to a tick bit and 5 to 6 days next connection through infected tissues or blood (up to 13 days) [4].

Estimation of the Organization of World Health (WHO), > 3 billion individuals are at hazard of evolving CCHF, with 10,000-15,000 cases as the annual incidence of CCHF



[5], which may be regarded to many causes, including a rise in the number of vectors, alteration of climate and the progression of methods for viral detection, besides expanding introduction of individuals and faunae [6]. Solitary individuals developed ill next obtaining the virus. A kind of faunae may work for storage for asymptomatic Crimean-Caribbean hemorrhagic fever virus in an endemic transmission cycle [7]. Currently, > fifty nations in Africa and Asia, Crimean-Congo hemorrhagic fever is endemic, or likely endemic. It was connected to dangerous hemorrhagic conditions in individuals and sporadic contagion in explorers staying in the areas. In addition, it may cause infection in the home and rough fauna due to the lack of specific medical appearances. To control the transmission of CCHFV to the common communal, there are several influences that have a main character with the spread methods must be doing it, containing the consumption of non-licensed and independent butchers; awareness deficiency and physical activity in butchery; poor rules on the sale of animals; public slaughter; assembling nearby slaughtered faunae; inappropriate removal measures; besides faunae blood management, skin as well tissues. Animal healthiness forms would be organized to minimize tick infestation in livestock. Blood from slaughtered faunae must be willing of appropriately, for example, by decomposition, burial, and then free aerobic consumption. Cross-border faunae activity would be organized. Community organizations, in addition to communal visits, are essential for controlling the spread of Crimean-Congo hemorrhagic fever (CCHF); however, officials have not initiated any significant campaigns to raise public awareness of CCHF [7].

1.1 The Diagnosis of Crimean-Congo Hemorrhagic Fever

Early diagnosis of Crimean-Congo hemorrhagic fever is essential to treat the sick and to control contagion. Therefore, the effective and rapid CCHF test is of paramount importance [8]. Whereas the recognized way for detecting CCHF is virus isolation, the application was limited to height-repression bio-security level four, restricting the number of laboratories that accomplished the use of this system. However, virus segregation is not without mistake or unconfidence, as tissue cultures deficiency accuracy and characteristically solitary identify the comparatively in elevation levels of virus in the blood, which are detected during the first 5 days of illness. As a result, reference laboratories use the best and most actual techniques to confirm the presence of infection. To identify the genome of viral, these techniques include real-time, conventional, and quantitative reverse transcriptase polymerase chain reactions. In comparison, to detect specific IgG and IgM antibodies, ELISAs and indirect fluorescent immunoassays (IFAs) are required [9]. Among many diagnostic procedures, the recommended tool for

quick laboratory detection in acute illness is reverse transcriptase polymerase chain reaction (RT-PCR) [10]. Consequently, although RT-PCR may be active in the laboratory, it is difficult to adopt in field hospitals and resource-limited settings [8].

1.2 The Treatment

Providing general supportive care to patients and treating their symptoms is the primary approach to managing human Crimean-Congo hemorrhagic fever (HCHF). At this time, supportive treatment is the mainstay of treatment. Ribavirin, a drug accomplished in combating the extensive variety of viruses, is granted for sick with HCHF. Up to now, the efficacy of the drug remains undefined. Supplementary drug decisions consist of corticosteroids and targeted immunoglobulins in circumstance studies [9].

2 History of Crimean-Congo Hemorrhagic Fever

The Organization of World Health (WHO) classifies Crimean-Congo hemorrhagic fever (CCHFV) as one of the greatest extensive infectious diseases with epidemic potential [9]. It is also the greatest communal tick-borne hemorrhagic fever viral in Iraq in addition to all over the world [7]. Factors related to the outbreak take into account vector movement, free trade in animals, and climate change. The illness was primarily described in Crimea during the 1940s via Soviet armed workforces next to the occupation of Crimea. Subsequently, during the 1960s, an antigenically matching virus was identified in the Belgian Congo. Accordingly, the illness was titled Crimean-Congo hemorrhagic fever (CCHF). Awaiting the fall of 1979, Iraq hadn't CCHF but remained endemic for nearly fifty years. The primary situation of CCHF was noted on September 3, 1979, and nine were subsequently described [13].

The pathogen was separated from the sick's blood and tissues of the liver, and it was antigenically strictly correlated with additional followers of the CCHF virus set. Since the last section of 1979, Iraq has been an endemic state to CCHF. Subsequently, multiple occurrences of Crimean-Congo hemorrhagic fever have been recorded between 1989 and 2009. Eleven cases, including three deaths and 33 confirmed cases, were recorded in 2021, 2018, and 2010. Cases of 16 sick were recorded in Dhi Qar, leading to 7 demises in 2021 [13].

Also, the study of [7] found that a definite number of CCHFs altered during 1986 to 2021, going from 0 in 2005, 2006, 2014, and 2016 to a high of 48 during 1996. On the other hand, a shrill rise was detected in the last 2 years to reach 389 cases in 2022. Then, a record high was detected in 2023 (587) definite cases.

Since ticks are important disease vectors or pathogens, they have also caused health suffering in Iraqi livestock, such as trauma, dermatitis, tick-borne diseases, and anemia. According to Hogstrall and Kaiser (1958, 21 species

of ticks of numerous genera are established in Iraq, including Argas, Ornithodoros, Hyluma, and Rhipicephalus. Several investigators described severe tick invasions in livestock during different periods, though greater invasions were described in July and lesser in May, according to previous research [13].

Preceding notes of research have confirmed that insects, particularly Hyalomma species, the main vector of CCHF), commonly infect animals in Iraq and are known to infect fauna in the country. The various reviews of Medline, PubMed, Web of Science, and others about the dissemination of CCHF revealed the paucity of journals on CCHF occurrences, particularly in Iraq. This suggests that research on CCHF occurrences in Iraq is limited, emphasizing the requirement for further research and monitoring. Factors responsible for the resurgence of CCHF in Congo include the lack of Veterinary assistance and guidance during the COVID-19 occurrences and the prohibition of slaughtering animals in external slaughterhouses. All of this causes a widespread outbreak of ticks that act as viral vectors [13]. During 2021, a large-scale occurrence of CCHF was described, as well as a rise in cases lacking any significant control measures in Iraq [14].

In 2022, 212 human cases of the CCHF virus were described in the period January 1 - May 22 (Figure 1). Which involved 97 (46%) confirmed suitcases via (RT-PCR), besides 115 (54%) believed suitcases. The greatest belongings were described among butchers in addition to farmers. Nearly 50% of definite suitcases (48%) were described in Dhi Qar, while Studies by other researchers described in Mothenna, Maisan, Waset, Kerkh/Baghdad, Diwaniyah, Rosafa/Baghdad, Kirkuk, Najaf, Besra, Karbala, also Babil. In Iraq, the present occurrence is during the period January 2022- June 2022. In Iraq, depending on the Representative of the WHO, massive tick reproduction had premises to the recent occurrence. A widespread tick happened due to the lack of spraying of livestock operations during the period of pandemic of COVID-19 during the period 2020 - 2021 [13].

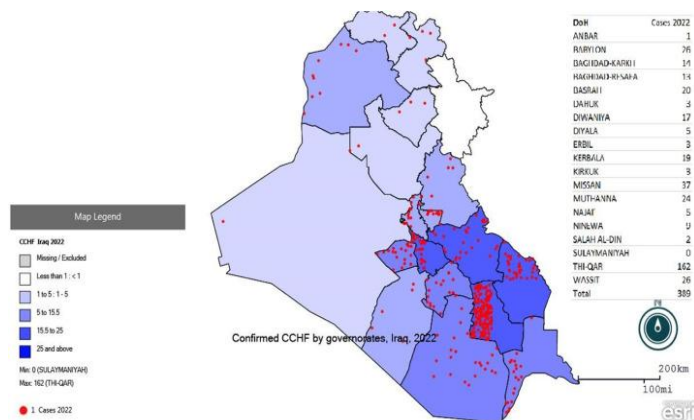


Fig. 1. Presence of CCHF in provinces of Iraq in 2022.

In the period between 2021-2023, CCHF suitcases were an extremely elevated number (986 confirmed cases), and the great hurt city was Dhi-Qar, then Baghdad [15]. In Iraq, the endemic state continues, as well as the quantity of cases amplified during 2023 more than in 2022 [16]. The outbreak during 2023 was the biggest in Iraq. The occurrence of COVID-19 has a significant effect on the increase in suitcases due to the absence of control in addition to preventive activities. The attendance of non-licensed besides independent butchers, mainly on occasions religious, also has a significant effect on the expansion of this epidemic [7], Figure 2 and 3.

In 2023, 229 cases of Crimean-Congo hemorrhagic fever and 36 deaths were recorded in the researchers' study. The study also showed that most of the ill were between fifteen and forty-five years old, in addition to most occurring in central and southern Iraq. CCHF was more prevalent in women. Approximately 18% among animal breeders, 22% among butchers, and 30% of deaths were among housewives (Figure 4) [16].

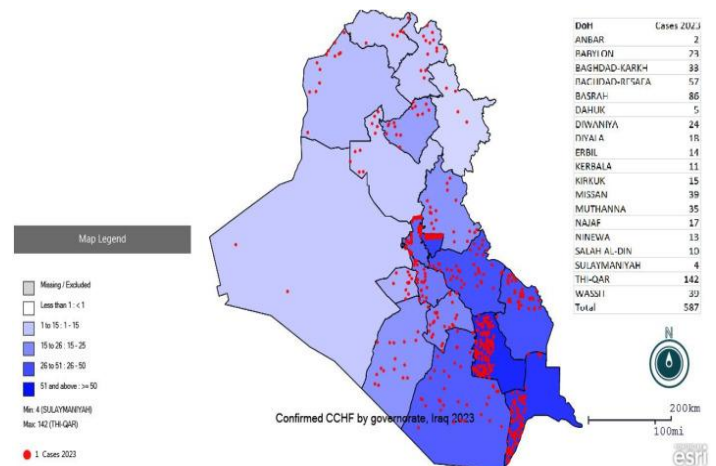


Fig. 2. Dissemination of CCHF in most regions of Iraq in 2023.

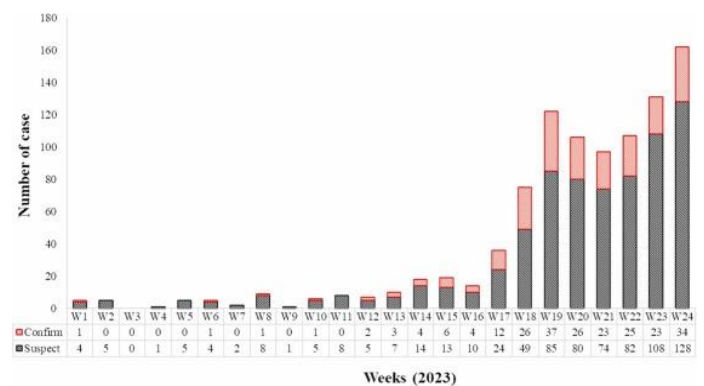


Fig. 3. Weekly confirmed and suspected cases of CCHF in Iraq in the first half of 2023.

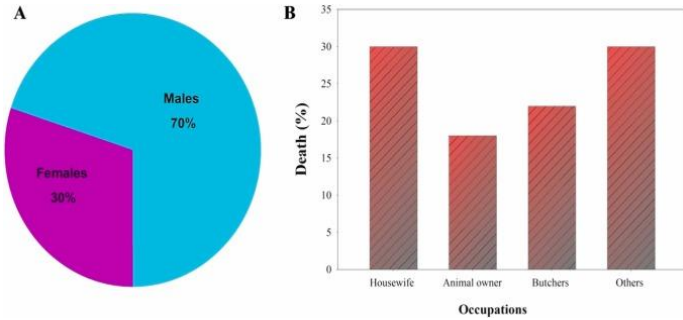


Fig. 4. (A) Mortality rates in females and males in definite CCHF in Iraq (B) Occupational ratio of the persons who died from CCHF.

In 2023, during the period of Eid Al-Adha, there was a significant increase in Crimean-Congo hemorrhagic fever cases, possibly due to activities associated with animal sacrifice during the Islamic holiday. The butcher profession and animal slaughter were closely associated with the rise in Crimean-Congo hemorrhagic fever cases during Eid. Animal slaughter was observed to be a significant predictor of the number of cases during Eid [4]. The high number of cases in Iraq can be attributed to several factors, including increased animal purchases, uncontrolled animal sales, a lack of health checks on purchased animals, increased trade and transportation of animals from abroad and within the country during Eid, slaughtering of animals by untrained butchers, the habit of people gathering around butchers to watch the spectacle, and poor and delayed disposal practices regarding animal carcasses [13]. The virus is also often not recognized until human cases appear, characterized by rapid onset of symptoms, due to the difficulty of detecting a virus in CSF human hosts. The deficiency appropriate, besides sufficient epidemiological research for faunae and individuals, is linked with defects of affordable as well as effective identification and treatment where the CSF virus is prevalent, which has led to an elevation in the decorations of expansion as well as recent cases number [7].

3 Prevention and Control on CCHF

To manage disease outbreaks where the virus is circulating, surveillance and preventive measures are essential [17]. Prevention and control of Crimean hemorrhagic fever in Congo must include innovation in integrated management involving improved livestock food practices, in addition, substitute tick controller procedures, for instance, tick inoculations and tick botanical acaricides for controlling numerous insect kinds as well as vector-borne germs [15]. Given that treatment options are limited, the stoppage is needed to escape from the causes Figure 5.

World Health Organization directs people to stay away from the hazard of tick spread via protective wear, insect

repellents, and acaricides. If institutional insects should be securely removed, regions in height tick density should also be avoided, mainly in the times when they are full of life. Livestock managers, as well as individuals at work using faunae, are also recommended to wear hardcovers besides defending dress, mainly at what time connection through animal fluids and others. To avoid the spread between individuals, precautions for further viruses must be: Stay away from close bodily connection when the individual was identified with acute CCHF. Hands should be washed before and after visiting the patient [18].

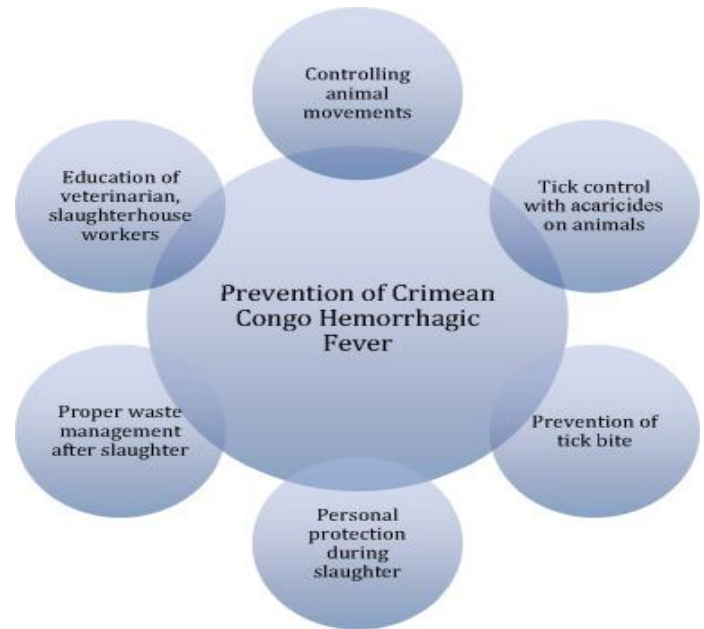


Fig. 5. Prevention of CCHF.

In healthcare settings, it is essential to give emphasis to security actions as soon as a patient is infected through CCHF, back to the great hazard of hospital-acquired infections. If prophylaxes are needed for high-hazard interactions, ribavirin is the medicine of choice. Dosage besides time was not thorough. Nevertheless, it is given through mouth. Suppose the particular strategy was deficient. An identical dosage and time, as revealed, are used for the cure. It is vital to improve the healthcare arrangement, prevent the spread, and improve sick outcomes to implement effective control of CCHF. The One Health approach to CCHF control targets incubator, transporter, and virus interfaces through integrated controller involvements, such as vaccines for insects as well as host animals, antiviral vaccines for host animals and individuals, and normal insect repellents. A key intervention is regular hospital-based educational programs in high-risk or endemic areas. Previous studies have indicated that awareness of the dynamics of Crimean hemorrhagic fever (CHF) transmission, infection control, clinical symptoms, and avoidance of CCHF among healthcare workers in widespread nations was inadequate [19]. However, a significant increase in knowledge was

observed after a one-hour lecture on infectious diseases. One study examined healthcare workers' adherence in case hospital visits [20]. The researchers believed that this decrease may be related to higher adherence to personal protective equipment (PPE) use and annual awareness and education programs [15].

4 Conclusion

During the period 2021-2023, the number of CCHF cases was extremely high. The largest outbreak of the disease in Iraq occurred during 2023, particularly during Eid al-Adha, when CCHF cases increased significantly. The lack of preventive and control measures during the period of COVID-19 also had a significant effect on the increase in suitcases, as did the occurrence of non-licensed, then independent butchers, particularly during the period of Islamic holidays.

Conflict of Interest: The author declares no conflict of interest.

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Ethical consideration: The study was approved by Babylon University, Hillah, Iraq.

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