

Crimean-Congo hemorrhagic fever in Iraq (2018-2022) and an educational review

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Abstract

Cerebrovascular diseases of ischemic genesis tend to increase, rejuvenate, are associated with severe clinical course, high rates of disability and mortality. The urgency of the problem of cerebrovascular diseases can rightfully be defined as extraordinary, requiring the concentration of efforts of specialists of different profiles to solve it. Subtotal cerebral ischemia leads to the development of morpho functional disturbances of the cerebral cortex. The introduction of Omega-3 polyunsaturated fatty acids has a corrective effect on the hippocampus in conditions of subtotal ischemia, reducing the number of shadow cells and hyperchromic shrunken neurons, without significantly affecting the size and shape of neurons in the cerebral cortex. Prior administration of L-NAME, the use of Omega-3 did not prevent the effects of the NO synthase inhibitor and associated NO deficiency at this dose and route of administration.

Keywords: neurons; cerebral ischemia; L-arginine; Omega-3 PUFAs

Introduction

The first patient with Crimean-Congo hemorrhagic fever was reported in Iraq for the first time on 3rd of September, 1979, and recurrent outbreaks were recorded thereafter with none more patients observed during the next two years. The virus was isolated from patients' blood and postmortem liver specimens. Eight patients had no epidemiological relationship to one another and were located around Baghdad and Al-Ramadi city (110 km to the west of Baghdad) cities. Eight patients had contact with sheep or cattle, two patients, a resident doctor and an auxiliary nurse, were infected in hospital by direct contact with patients. Crimean-Congo hemorrhagic fever has been considered as an endemic disease in Iraq [1].

Little is known about the epidemiological state of the disease in Iraq during the previous years

Patients and methods

An overview of the cases of Crimean-Congo

hemorrhagic fever registered by the Iraqi Ministry of Health from January, 2018 to May, 2022 is provided. An educational review is presented in the "Discussion".

Results

During the year 2018, there were more than 140 suspected cases of Crimean-Congo hemorrhagic fever, but only ten cases (including 3 from Diwaniya province) confirmed by Reverse Transcriptase Polymerase Chain Reaction were registered by the Iraqi Ministry of Health, and death occurred in eight of the confirmed cases.

During the year 2021, there were about 45 suspected cases (including 10 cases from ThiQar, a Southern Province), but the Iraqi Ministry of Health reported the registration of fifteen laboratory confirmed cases of Crimean-Congo hemorrhagic fever during the period from April to November 2021. There were nine deaths including 5 deaths occurring in laboratory confirmed cases.

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During the years 2018 and 2021, the disease was commoner in males than females, and the affected patients were workers in animal slaughterhouses, but it also occurred in some health care workers. On the 27th of April 2022, the Iraqi Ministry of Health registered 17 cases of laboratory confirmed hemorrhagic fever occurred during the year 2022, and many cases were from ThiQar, and five deaths occurred.

Discussion

Crimean-Congo hemorrhagic fever is a severe hemorrhagic febrile illness with bleeding into the skin and can be complicated by liver failure. It is caused by a single-stranded RNA orthonairovirus virus, in the genus Nairovirus, family Bunyaviridae. The virus can be transmitted to humans from animals during slaughtering or by ticks in the genus *Hyalomma*, family *Ixodidae* (Figure-1) bite [2-8].

The clinical occurrence of Crimean hemorrhagic fever has been reported as early as the 1950s [2], and a viral etiology has been suggested in 1963 by Mikhail Petrovich Chumakov (Figure-2) [3].



Fig 1: Mikhail Petrovich Chumakov, a Russian virologist (November 14, 1909-June 11, 1993)

During February 1967, John P. Woodall (Figure-3), David Simpson, and their research groups reported a previously undescribed virus which cause hemorrhagic fever and they called it "Congo virus"[4, 5].



Fig 2: John Payne Woodall (1935–2016), a British/American virologist.

During June 1967, Mikhail Chumakov and his research group reported a fatal case of Crimean hemorrhagic fever in Samarkand in caused by Arthropod-borne Virus [6].

Perelatov and Chumakova (1967) emphasized the relation between the ecology of *Hyalomma plumbeum* ticks and the Donetsk focus of Crimean hemorrhagic fever [7].

In 1969, Jordi Casals (Figure-4) reported that the virus caused the Crimean hemorrhagic fever and the Congo virus are antigenically indistinguishable [8]



Fig 3: Jordi Casals i Ariet (May, 15, 1911- February, 10, 2004), a Catalanian physician and epidemiologist

In 2008, Önder Ergönül (Figure-5) from Istanbul emphasized that Crimean-Congo hemorrhagic has the widest geographic distribution of the tick-borne viral disease. He also emphasized that intravenous and oral ribavirin have been used in the treatment of the disease in addition to the supportive management for more than two decades despite their efficacy has been suggested by observational studies only, and placebo-controlled studies have not been conducted for ethical reasons [9].



Fig 4: Önder Ergönül from Istanbul

However, in 2009, Nuriye Taşdelen Fışgın (Figure-6) and her colleagues including Önder Ergönül emphasized that Crimean-Congo hemorrhagic fever is a serious disease that can be associated with high

mortality, and they reported the treatment of fifty-two patients. Twenty-one patients were treated with ribavirin within four days of the onset, and 20 patients were treated with ribavirin more than or at five days after the onset. In addition, eleven patients received no ribavirin. They found that the early use of ribavirin was associated with beneficial effects including beneficial effects on platelets count and liver enzymes and therefore they recommended the early use of ribavirin in the treatment.



Fig 5: Nuriye Taşdelen Fişgin

In 2018, Önder Ergönül and his research group, based on a meta-analysis and systematic review on the usefulness of ribavirin in the prevention of infection and death of workers exposed Crimean-Congo hemorrhagic fever patients, they recommended ribavirin post-exposure prophylaxis and early ribavirin treatment for workers at medium-to-high risk [11].

Conclusion

42 cases of laboratory confirmed cases of Crimean-Congo hemorrhagic fever occurred in Iraq during the period from January, 2018 to May, 2022. The disease is still endemic in Iraq and was associated with a high mortality as 18 of the 42 confirmed cases died. Therefore, we are recommending using the available research evidence suggesting the early use of ribavirin in the treatment of patients, and also using ribavirin post-exposure prophylaxis and early ribavirin treatment for workers at medium-to-high risk.

Conflict of interest

None

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